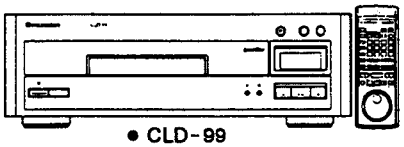
PIONEER®
The Art of Entertainment

Service Manual



• CLD-99

ORDER NO.
RRV1294

CD CDV LD PLAYER

CLD-99
CLD-79

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	CLD-99	CLD-79		
KU/CA	○	○	AC120V	

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols ⊣▮⊢ (fast operating fuse) and/or ⊣▮⊠⊢ (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible ⊣▮⊢ (fusible de type rapide) et/ou ⊣▮⊠⊢ (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

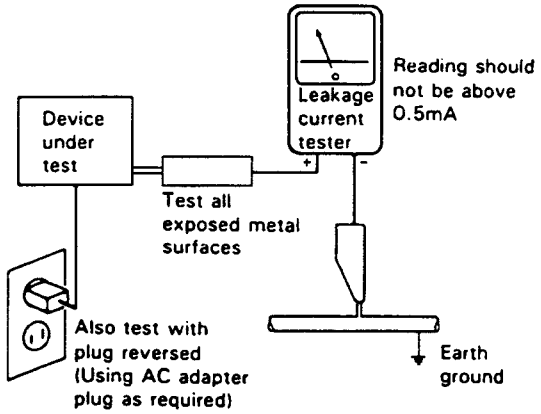
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

2.1 EXTERIOR AND DISC TRAY SECTION

(1) CONTRAST OF CLD-99/KU/CA AND CLD-79/KU/CA

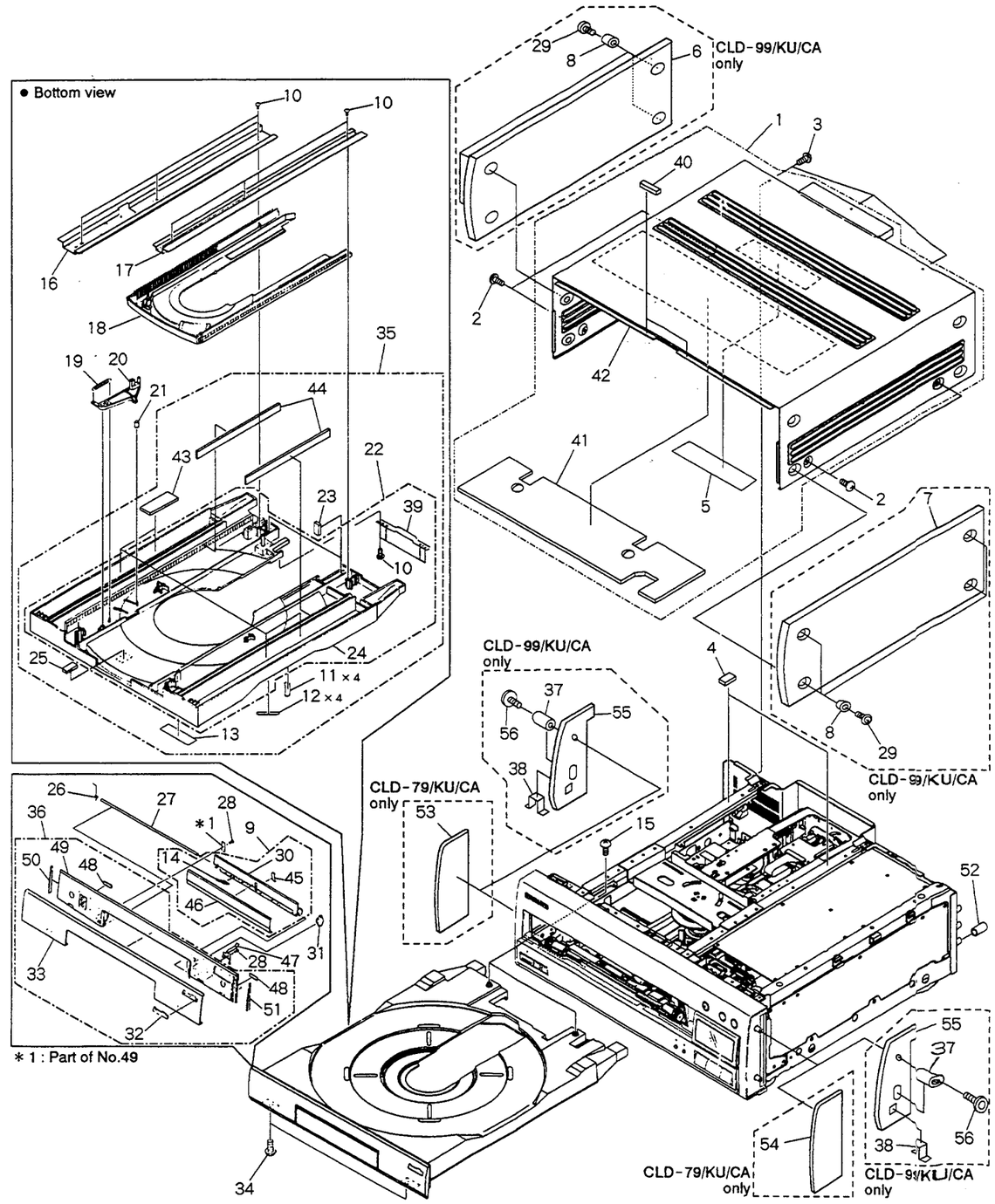
CLD-99/KU/CA and CLD-79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No. CLD-99 /KU/CA	Part No. CLD-79 /KU/CA
	1	Bonnet assy-S	VXX2233	VXX2272
	6	Side wood L	VAP1024	Not used
	7	Side wood R	VAP1025	Not used
	8	Wood collar	PNW1238	Not used
	18	CD tray	VNK3066	VNK2395
	22	LD tray assy	VXA2204	VXA2158
	29	Screw	VBA1043	Not used
	35	Tray assy-S	VXX2231	VXX2273
	37	Collar	VLL1475	Not used
	38	Side earth	VBK1055	Not used
NSP	42	Bonnet	VNA1543	VNA1355
NSP	53	Side rubber (L)	Not used	VEB1224
NSP	54	Side rubber (R)	Not used	VEB1225
	55	Side maul (AL)	VAH1234	Not used

(2) PARTS LIST FOR CLD-99/KU/CA

Mark	No.	Description	Part No.
	1	Bonnet assy-S	VXX2233
	2	Screw	BCZ40P060FZK
	3	Screw	BBT30P060FCC
NSP	4	Damp cushion	VEC1602
	5	65 label	ORW1069
	6	Side wood L	VAP1024
	7	Side wood R	VAP1025
	8	Wood collar	PNW1238
	9	CD door assy-S	VXX2232
	10	Screw	BPZ30P060FCU
	11	Disc pad (Large)	VEC1657
	12	Disc pad (C)	VEC1658
NSP	13	Label	VRW1289
	14	CD earth	VBK1051
	15	Screw	VBA1032
	16	Guide plate (R)	VNE1806
	17	Guide plate (L)	VNE1805
	18	CD tray	VNK3066
	19	Lock plate spring	VBH1188
	20	Lock plate	VNL1513
	21	Tray rubber	VEB1091
	22	LD tray assy	VXA2204
NSP	23	Cushion	VEC1660
NSP	24	LD tray	VNK2897
NSP	25	Damp cushion	VEC1110
	26	Door spring	VBH1223
	27	Door shaft	RLA1182
	28	Screw	IPZ20P050FMC
	29	Screw	VBA1043
NSP	30	CD door	VNK2842
	31	Damper assy	VXA2112
NSP	32	Laser disc badge	VAM1022
NSP	33	Tray panel (AL)	VAH1232
	34	Screw	BPZ30P060FCU
	35	Tray assy-S	VXX2231
	36	Tray panel assy-S	VXX2228
	37	Collar	VLL1475
	38	Side earth	VBK1055
NSP	39	Tray back	VNE1946
NSP	40	Hold rubber	PEB1216
NSP	41	Top damper	VEB1245
NSP	42	Bonnet	VNA1543
NSP	43	Tray damper	VEB1232
NSP	44	Rack damper	VEB1233
NSP	45	CD cushion	VEC1733
NSP	46	CD door (AL)	VAH1230
	47	LD earth	VBK1050
	48	Cushion	VEC1497
NSP	49	Tray panel	VNK2840
NSP	50	Tray spacer L	VNK2947
NSP	51	Tray spacer R	VNK2948
NSP	52	Cap	VEC1810
	53	• • • • •	
	54	• • • • •	
	55	Side maul (AL)	VAH1234
	56	Screw	IBZ40P080FCC

NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.



2.2 TOP VIEW AND DISC CLAMPER SECTION

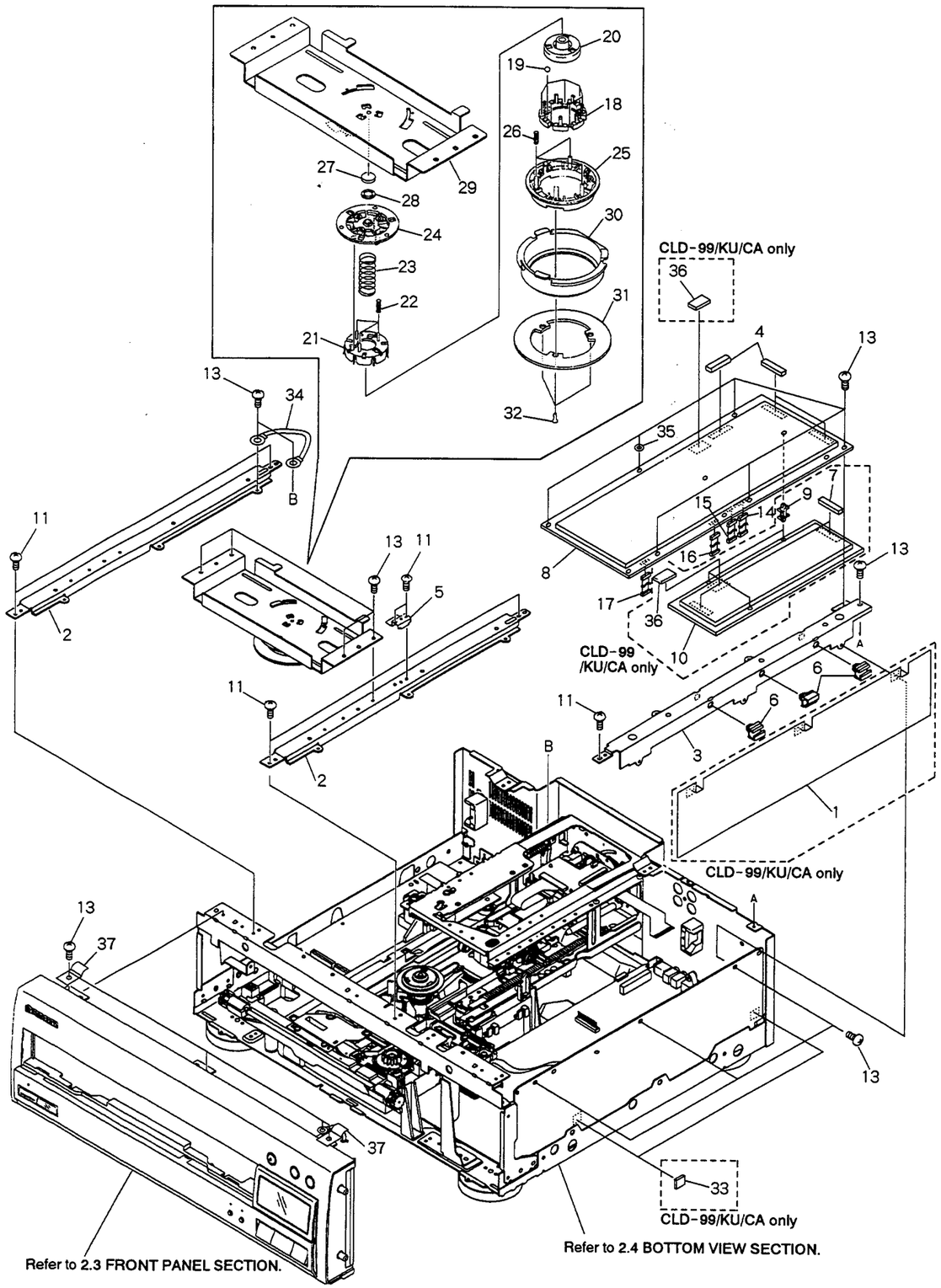
(1) CONTRAST OF CLD - 99/KU/CA AND CLD - 79/KU/CA

CLD - 99/KU/CA and CLD - 79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD - 99 /KU/CA	CLD - 79 /KU/CA
NSP	1	Shield sheet	VEF1045	Not used
	3	PCB holder	VNE1962	VNE1895
NSP	7	Hold rubber	VEB1216	Not used
	8	DVDB assy	VWV1420	VWV1421
NSP	9	PC support	VEC1415	Not used
	10	TDYC assy	VWV1377	Not used
NSP	33	Support cushion	VEC1750	Not used
	36	EMI gasket	VEC1826	Not used

(2) PARTS LIST FOR CLD-99/KU/CA

Mark	No.	Description	Part No.
NSP	1	Shield sheet	VEF1045
	2	Center angle	VNE1897
	3	PCB holder	VNE1962
	4	Hold rubber	VEB1226
	5	Damper plate	VBK1045
NSP	6	P plate holder	PNY - 405
NSP	7	Hold rubber	VEB1216
	8	DVDB assy	VWV1420
NSP	9	PC support	VEC1415
	10	TDYC assy	VWV1377
	11	Screw	BBT30P080FCC
	12	• • • • •	
	13	Screw	IBZ30P080FCC
	14	Connector assy (5P)	PF05PP2B25
	15	Connector assy (6P)	PF06PP - B25
	16	Connector assy (13P)	PF13PP - B20
	17	Housing assy (5P)	VKP2051
	18	Ball guide	VNL1616
	19	Ball	VNX1013
	20	LD hab	VNT1047
	21	Ball cover	VNL1602
	22	Cover spring	VBH1234
	23	LD spring	VBH1240
	24	Clamper head	VNL1603
	25	Clamper	VNL1604
	26	Clamp spring	VBH1239
	27	Rubber mat	VEB1114
	28	Thrust holder	VNL1663
	29	Center plate	VNE1898
	30	Clamper holder	VNL1605
	31	Stabilizer	VNE1906
	32	Screw	CPZ20P060FMC
NSP	33	Support cushion	VEC1750
NSP	34	Earth lead assy	VDA1479
	35	Washer	VEC1450
	36	EMI gasket	VEC1826
NSP	37	Earth plate	VNE1518



2.3 FRONT PANEL SECTION

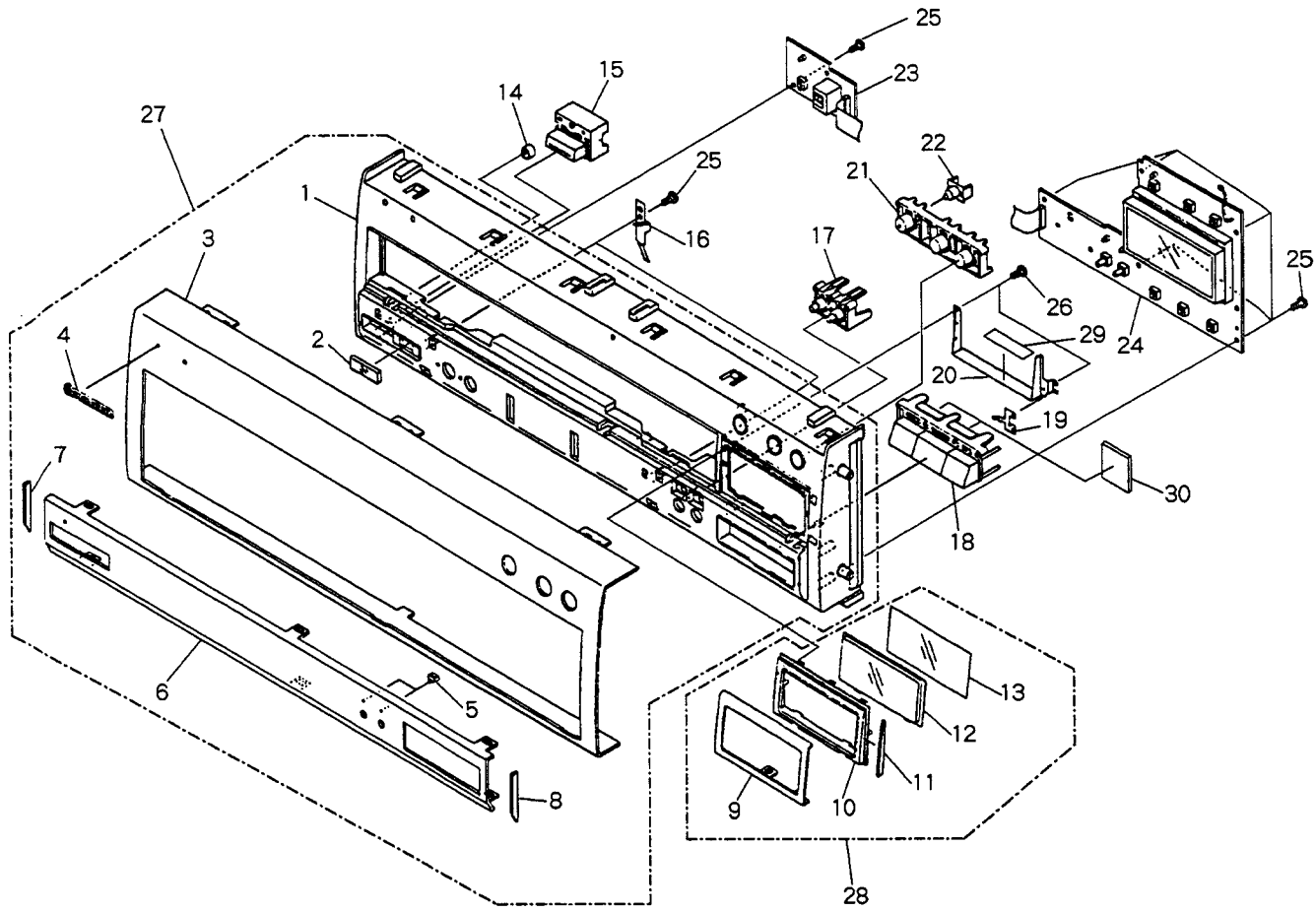
(1) CONTRAST OF CLD-99/KU/CA AND CLD-79/KU/CA

CLD-99/KU/CA and CLD-79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD-99 /KU/CA	CLD-79 /KU/CA
NSP	1	Front panel	VNK3101	VNK2838
NSP	3	Front panel (AL)	VAH1227	VAH1239
	24	FLKY assy	VWG1644	VWG1645
	27	Front panel assy-S	VXX2229	VXX2271

(2) PARTS LIST FOR CLD-99/KU/CA

Mark	No.	Description	Part No.
NSP	1	Front panel	VNK3101
	2	Sensor lens	RNK2085
NSP	3	Front panel (AL)	VAH1227
	4	Name plate	VAM1032
	5	LED lens 1	RNK2066
NSP	6	Under sash	VAH1228
NSP	7	Sash spacer L	VNK2945
NSP	8	Sash spacer R	VNK2946
NSP	9	Sub alum.	VAH1231
NSP	10	Sub panel	VNK2844
NSP	11	Tray spacer R	VNK2948
	12	FL lens	VNK2845
	13	FL filter	VEC1769
	14	LED lens	PNW2019
	15	PW button	VNK2853
	16	Panel earth	VBK1052
	17	L key (B)	VNK2849
	18	Main key	VNK2851
	19	Sub earth	VBK1048
	20	Back plate	VNE1961
	21	L key (A)	VNK2847
	22	LED lens A	VNL1659
NSP	23	PONS assy	VWG1571
	24	FLKY assy	VWG1644
	25	Screw	BPZ26P080FCU
	26	Screw	BPZ20P060FCU
	27	Front panel assy-S	VXX2229
	28	Sub panel assy-S	VXX2230
	29	Tape	VED1008
	30	Cushion	VEC1807



2.4 BOTTOM VIEW SECTION

(1) CONTRAST OF CLD-99/KU/CA AND CLD-79/KU/CA

CLD-99/KU/CA and CLD-79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD-99 /KU/CA	CLD-79 /KU/CA
NSP	1	Base chassis	VNA1478	VNA1347
	2	Insulator assy	VXA1450	VXA1996
⚠	7	AC power cord	VDG1046	PDG1015
	8	AC cord stopper	Not used	CM-22C
	9	Rear panel assy-S	VXX2234	VXX2260
	11	SACB assy	VWS1191	VWS1189
	27	Screw	IBZ30P150FCC	IBZ30P080FCC
NSP	30	Label	VRW1495	VRW1509
NSP	32	Rear panel	VNA1541	VNA1568
NSP	35	Shield cover	VEF1046	Not used
	37	ICP caution label	VRW1538	VRW1401

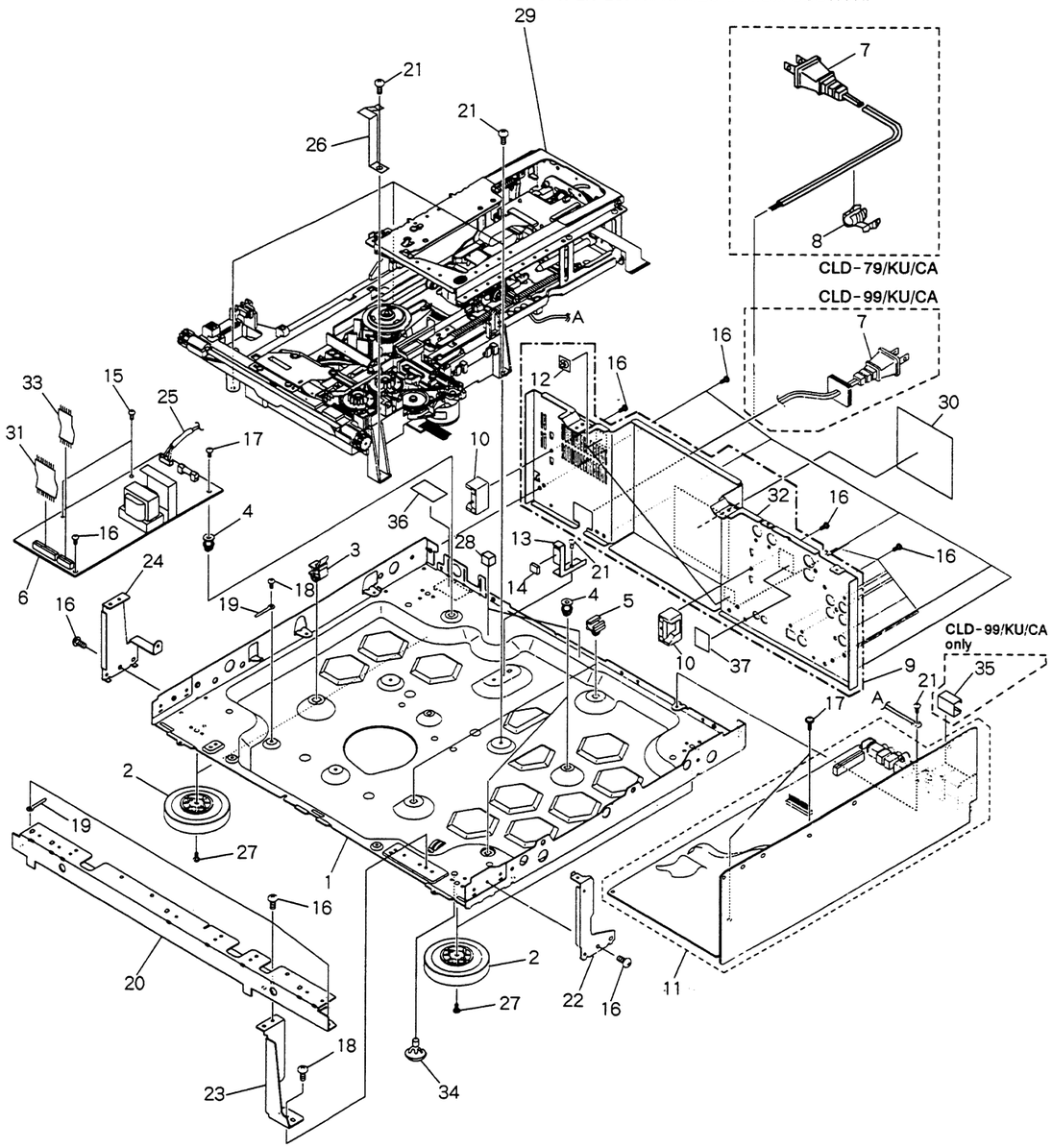
(2) PARTS LIST FOR CLD-99/KU/CA

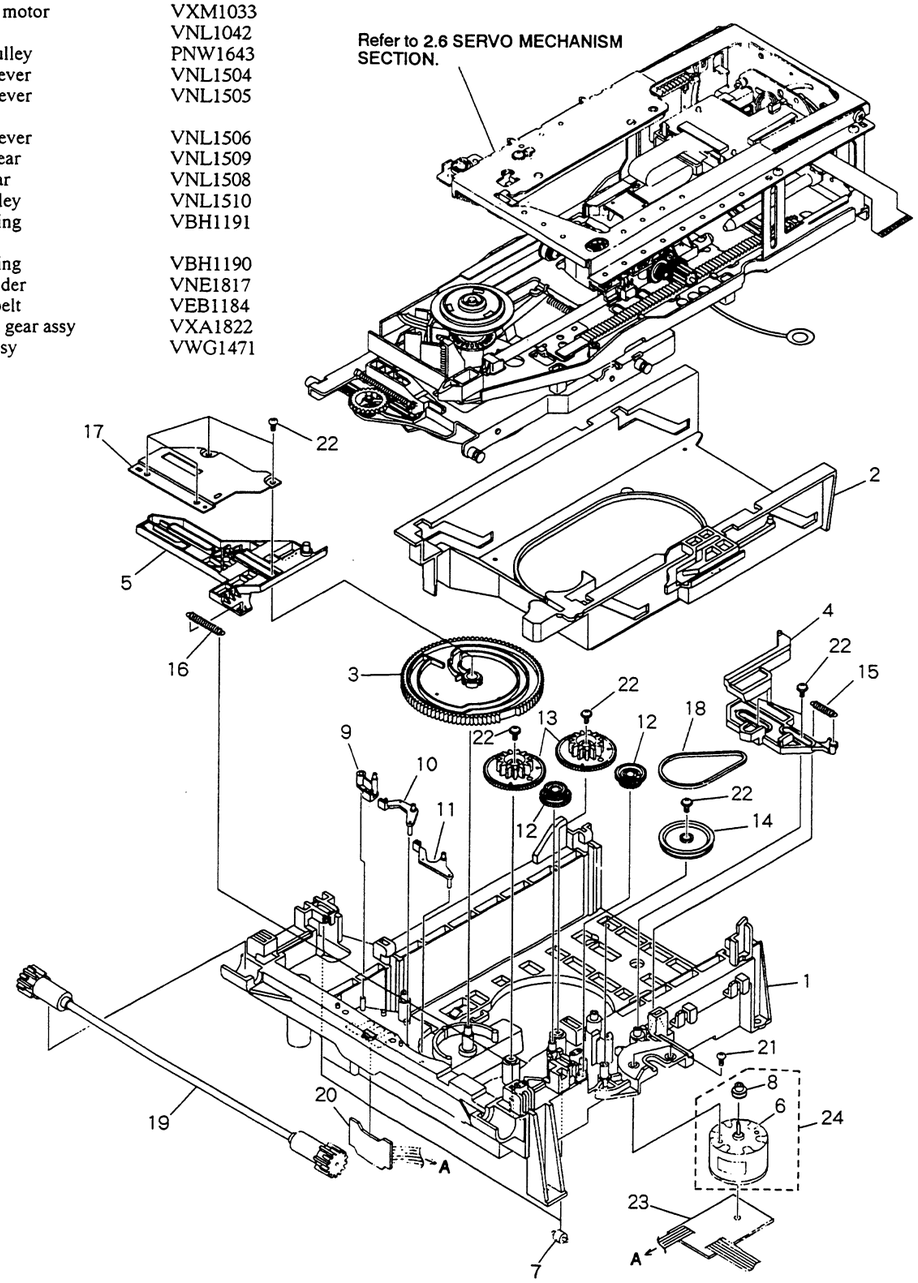
Mark	No.	Description	Part No.
NSP	1	Base chassis	VNA1478
	2	Insulator assy	VXA1450
	3	PCB spacer	VEC1623
	4	PCB spacer	PNY-404
NSP	5	PCB hinge	VEC1174
⚠	6	SYPS assy	VWR1200
⚠	7	AC power cord	VDG1046
	8	• • • • •	
	9	Rear panel assy-S	VXX2234
	10	Tray stopper	VNL1600
	11	SACB assy	VWS1191
NSP	12	Mini clamp	VEC1312
	13	Carriage stopper	VNE1919
NSP	14	Damp cushion	VEC1602
	15	Screw	IBZ30P080FMC
	16	Screw	BBT30P080FCC
	17	Screw	BPZ30P140FMC
	18	Screw	BBZ30P040FMC
NSP	19	Cord holder	Z09-061
	20	Front angle	VNE1894
	21	Screw	BBZ30P060FCC
	22	Side stay	VNE1896
NSP	23	Side stay(R)	VNE1810
NSP	24	Side stay(L)	VNE1809
	25	UL tubing	VEC1651
	26	Mecha. earth	VBK1049
	27	Screw	IBZ30P150FCC
NSP	28	HM spacer	VEB1215
NSP	29	Mechanism assy	VWT1101
	30	Label	VRW1495
	31	Flat cable 12P	D20PYY1275E
NSP	32	Rear panel	VNA1541
NSP	33	Flat cable 6P	D20PYY0640E
NSP	34	PC support	VEC1749
NSP	35	Shield cover	VEF1046
NSP	36	Fuse caution label	VRW-548
	37	ICP caution label	VRW1538

2.5 LOADING MECHANISM SECTION

Parts List

Mark	No.	Description	Part No.
	1	Mechanism base	VNK1990
	2	Clamp cam	VNL1621
	3	Cam gear	VNL1507
	4	CD plate	VNL1576
	5	Cam sand	VNL1511
NSP	6	Carriage motor	VXM1033
	7	Roller	VNL1042
	8	Motor pulley	PNW1643
	9	L-SW lever	VNL1504
	10	C-SW lever	VNL1505
	11	R-SW lever	VNL1506
	12	Center gear	VNL1509
	13	Twin gear	VNL1508
	14	Gear pulley	VNL1510
	15	CDP spring	VBH1191
	16	CAS spring	VBH1190
	17	Shaft holder	VNE1817
	18	Rubber belt	VEB1184
	19	Synchro. gear assy	VXA1822
NSP	20	LOSB assy	VWG1471
	21	Screw	BMZ26P040FMC
	22	Screw	Z39-019
NSP	23	LOMB assy	VWG1470
	24	Loading motor assy	VXX1712

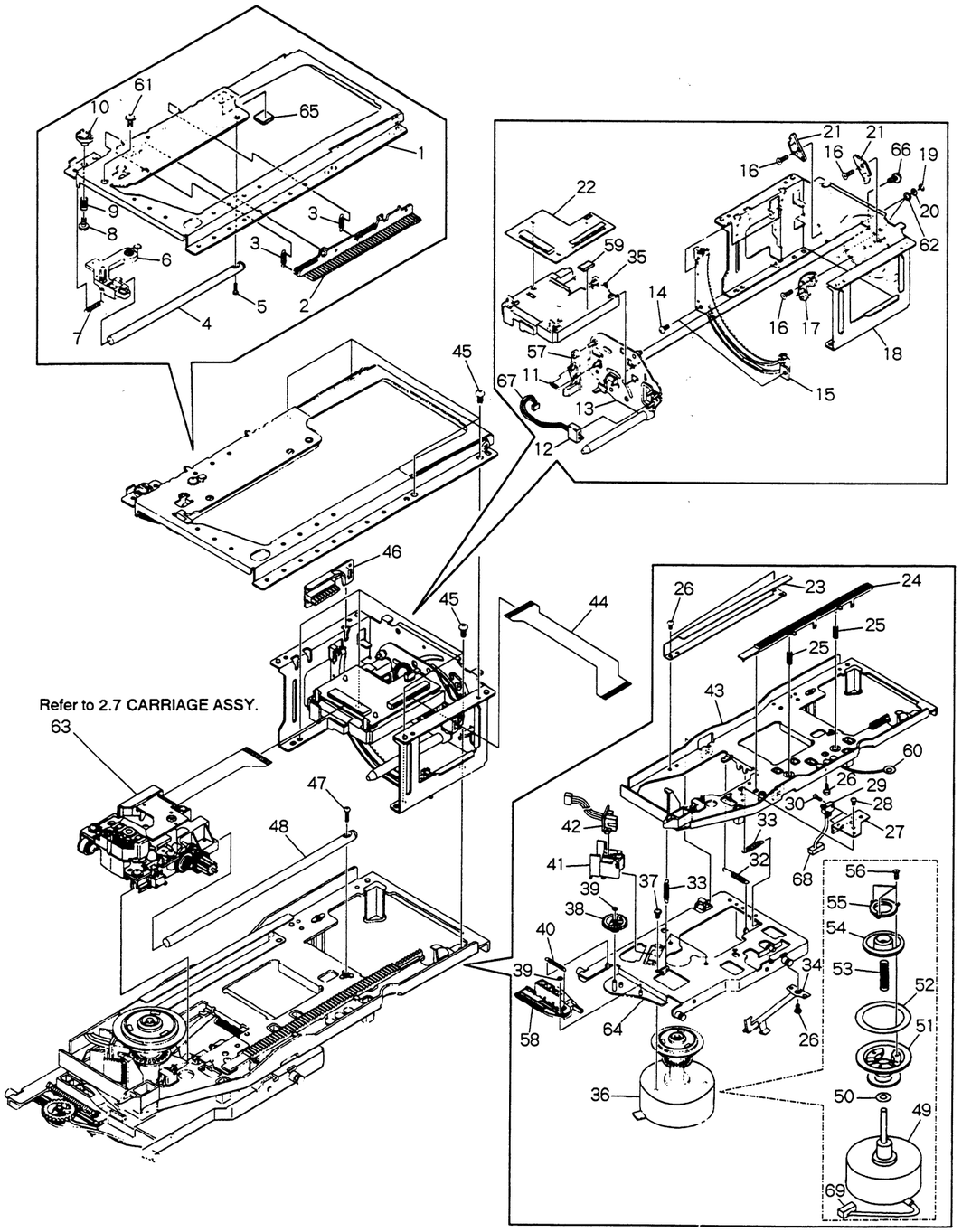




2.6 SERVO MECHANISM SECTION

Parts List

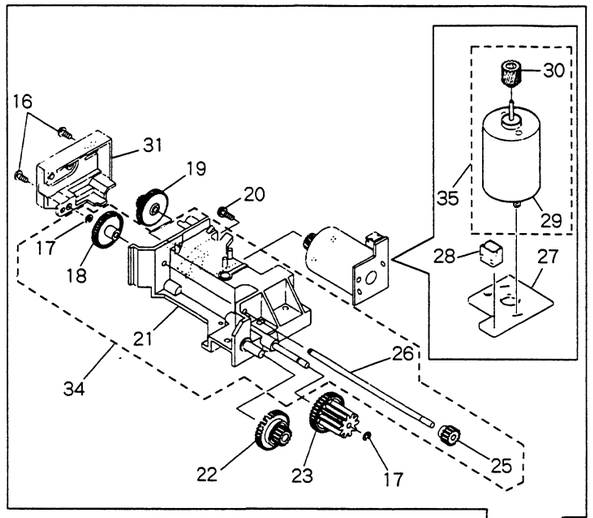
Mark	No.	Description	Part No.
	1	Tilt base (upper)	VNB1027
	2	Rack (upper)	VNL1560
	3	Rack spring (upper)	VBH1213
	4	CA shaft (upper)	VLL1446
	5	Screw	PMZ20P070FMC
	6	Shaft support	VNL1563
	7	Support spring	VBH1236
	8	Screw	IPZ30P060FMC
	9	B cam spring	VBH1233
	10	B cam	VNL1564
	11	Lever spring	VBH1214
	12	Lever SW	DSK1003
	13	R plate assy	VNL1566
	14	Screw	BBZ26P060FMC
	15	TM rack	VNL1556
	16	Screw	CBZ26P060FMC
	17	Turn gear	VNL1565
	18	TM support	VNE1888
	19	Washer	YE20FUC
	20	Washer	WA32D080D050
	21	Head lock	VNL1580
NSP	22	CNNB assy	VWG1469
	23	TAN guide	VNE1887
	24	Rack (lower)	VNL1567
	25	Rack spring (lower)	VBH1215
	26	Screw	BBZ30P060FMC
	27	SW base	VNE1886
	28	Screw	PBZ26P060FMC
	29	Slide SW	OSH1001
	30	Screw	PMZ20P060FMC
	31	• • • • •	
	32	Thrust spring	VBH1235
	33	Tilt spring	VBH1218
	34	Key lock	VBK1044
	35	CB holder	VNL1618
⚠	36	Spindle motor assy	VXA1986
	37	Screw	PMA30P050FMC
	38	Y gear	VNL1501
	39	Washer	WT26D060D025
	40	Tilt cam spring	VBH1189
	41	FG base	VNL1577
NSP	42	FG assy	VWG1472
	43	Tilt base (lower)	VNL1555
	44	MK flexible	VNP1439
	45	Screw	ABZ30P060FMC
	46	TM guide	VNL1558
	47	Screw	PPZ20P080FMC
	48	CA shaft (lower)	VLL1447
NSP	49	Spindle motor	VXM1053
NSP	50	Oil stopper washer	VBF1002
NSP	51	Turn table assy	VXA1760
NSP	52	Rubber sheet	VEB1237
	53	Centering spring	VBH1024
	54	PRC hub	VNL1612
	55	PRC table	VNL1613
	56	Screw	CPZ20P060FMC
	57	Lock lever	VNL1562
	58	Tilt cam	VNL1559
	59	Spacer	VEB1020
NSP	60	Earth lead unit	VDA1455
	61	Screw	Z39-019
	62	Washer	WA32D080D025
	63	Carriage assy	VWT1100
	64	Motor base	VNE1889
NSP	65	Stop cushion	VEC1605
	66	Screw	CPZ26P080FMC
	67	Housing assy (3P)	VKP2011
	68	Housing assy (4P)	VKP2025
	69	Housing assy	VKP2020

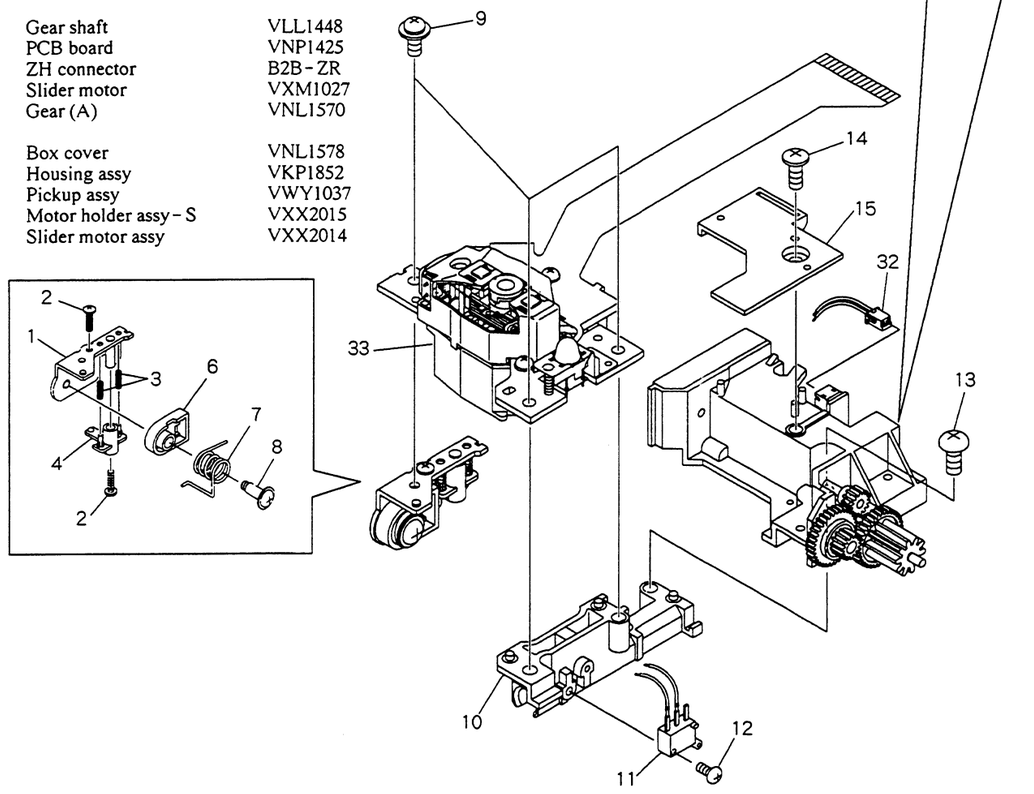


2.7 CARRIAGE ASSY

Parts List

Mark	No.	Description	Part No.
	1	TAN plate assy	VXA1981
	2	Screw	BMZ20P080FMC
	3	TAN spring (B)	VBH1217
	4	TAN lever (B)	VNL1569
	5	• • • • •	
	6	TAN lever (A)	VNL1568
	7	TAN spring (A)	VBH1237
	8	Screw (S)	VBA1016
	9	Screw	PBB26P080FMC
NSP	10	Shaft holder	VNT1042
	11	Limit SW	OSH1001
	12	Screw	PMZ20P060FMC
	13	Screw	BBZ26P060FZK
	14	Screw	BPZ26P060FMC
	15	Flexible holder	VNL1579
	16	Screw	PPZ20P060FZK
	17	Washer	WT17D034D050
NSP	18	Gear (C)	VNL1572
	19	Gear (B)	VNL1571
	20	Screw	PMA20P040FMC
NSP	21	Motor holder	VNL1584
	22	Gear (E)	VNL1574
	23	Gear (F)	VNL1575
	24	• • • • •	
NSP	25	Gear (D)	VNL1573
NSP	26	Gear shaft	VLL1448
NSP	27	PCB board	VNP1425
NSP	28	ZH connector	B2B-ZR
NSP	29	Slider motor	VXM1027
	30	Gear (A)	VNL1570
	31	Box cover	VNL1578
	32	Housing assy	VKP1852
NSP	33	Pickup assy	VWY1037
	34	Motor holder assy-S	VXX2015
	35	Slider motor assy	VXX2014





2.8 PACKING

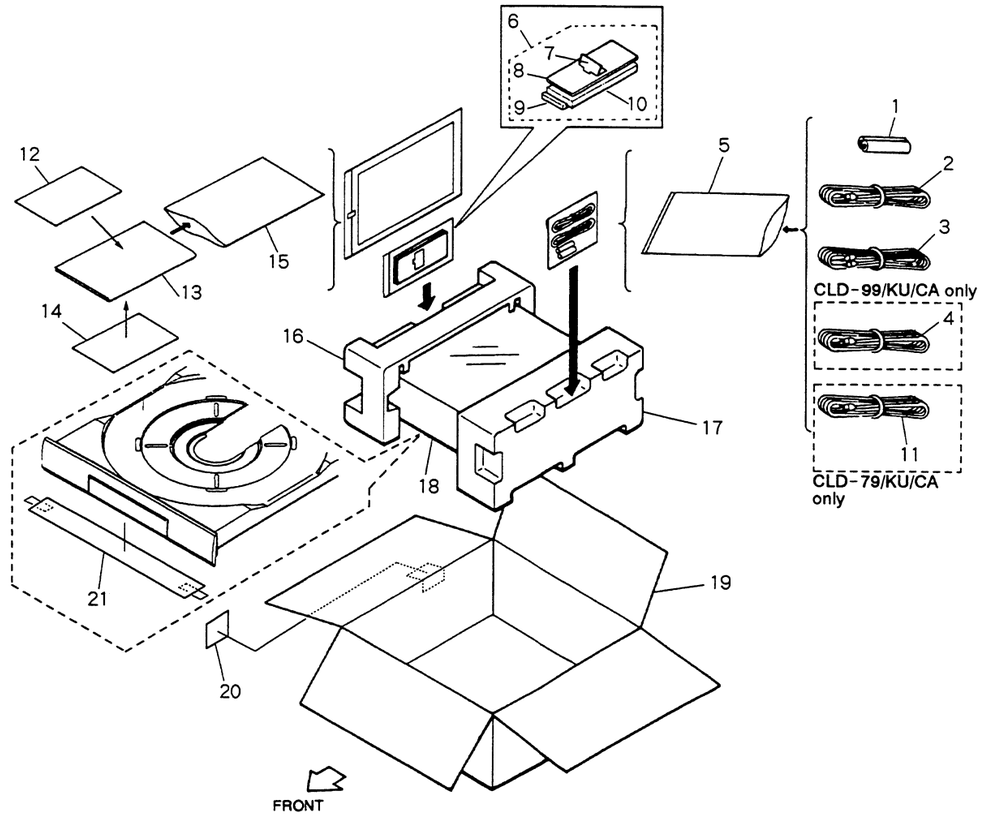
(1) CONTRAST OF CLD-99/KU/CA AND CLD-79/KU/CA

CLD-99/KU/CA and CLD-79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD-99 /KU/CA	CLD-79 /KU/CA
	2	Video cord	VDE1003	VDE1034
	3	Audio cord	PDE1003	VDE1033
	4	S video cord	VDE1013	Not used
	6	Remote control unit	VXX2224	VXX2255
	11	4P mini DIN cable	Not used	DDE1040
	13	Operating instructions	VRB1139	VRB1141
	19	Packing case	VHG1426	VHG1440

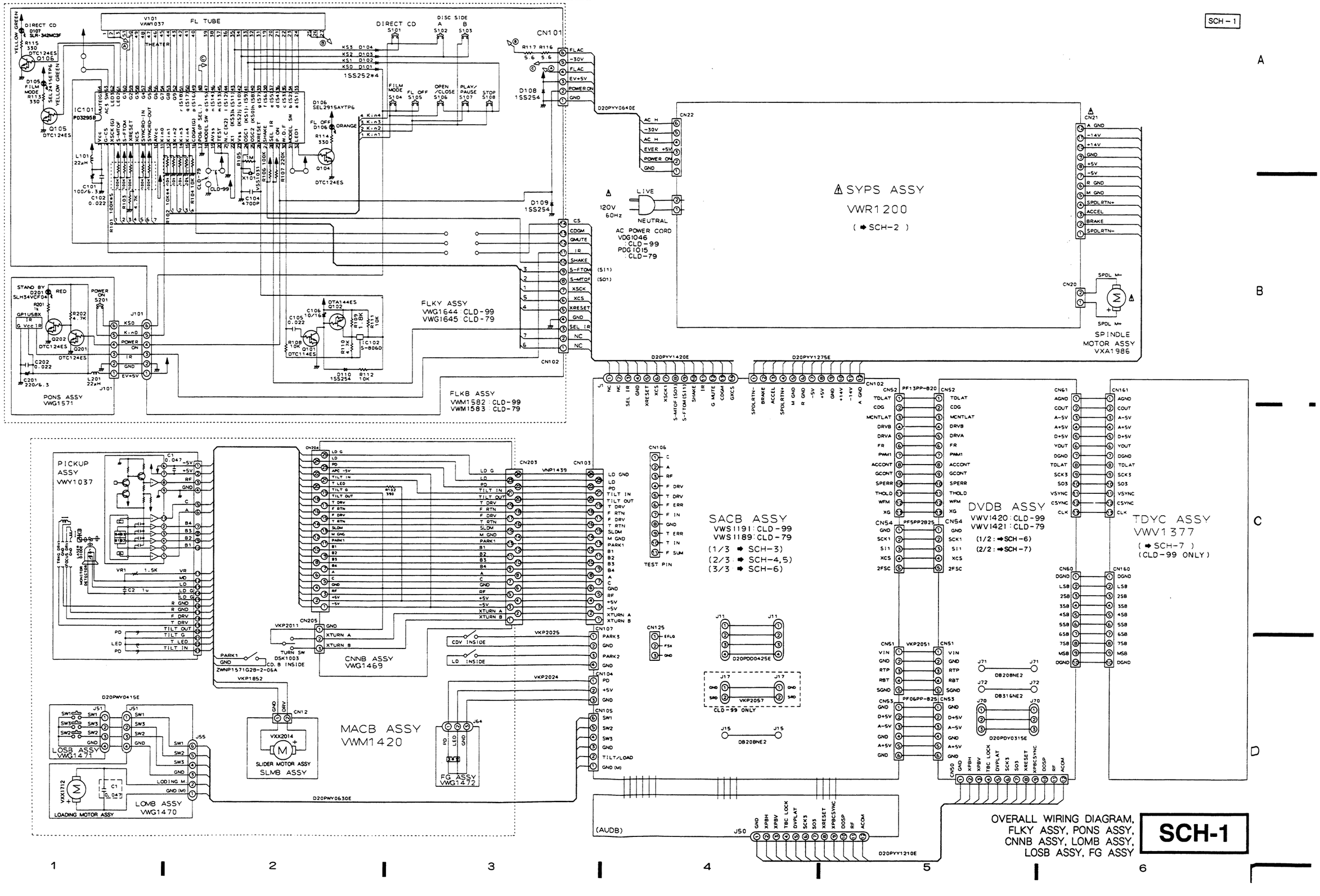
(2) PARTS LIST FOR CLD-99/KU/CA

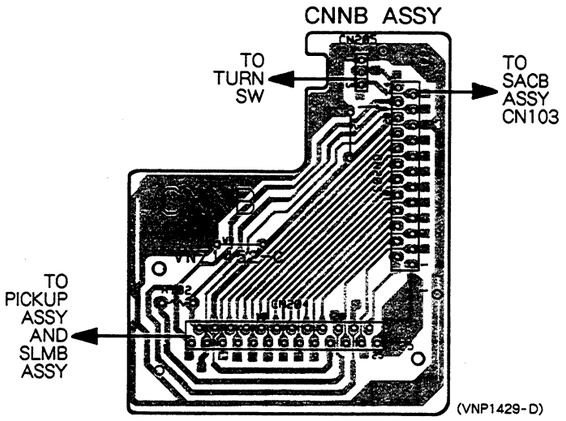
Mark	No.	Description	Part No.
NSP	1	Battery (R03, AAA)	VEM-022
	2	Video cord	VDE1003
	3	Audio cord	PDE1003
	4	S video cord	VDE1013
NSP	5	Polyethylene bag (205*315*0.05)	Z21-029
	6	Remote control unit	VXX2224
	7	Battery cover	DNK2286
	8	Case (below)	VNK2062
	9	Filter	VNK2063
	10	Case (upper)	VNK3183
	11	• • • • •	
NSP	12	Warranty card	ARY1026
	13	Operating instructions (English)	VRB1139
	14	Caution (UC)	VRR1020
NSP	15	Polyethylene bag	VHL-014
	16	Pad L	VHA1163
	17	Pad R	VHA1164
	18	Mirror mat	VHL1012
	19	Packing case	VHG1426
	20	Caution label	VRM1044
	21	Mirror mat sheet	VHL1024

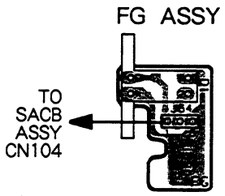


3. SCHEMATIC AND PCB CONNECTION DIAGRAMS

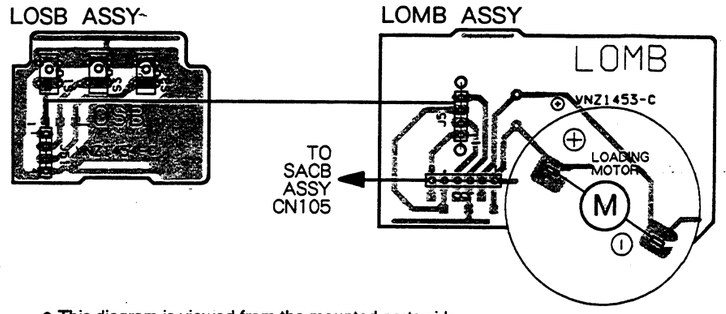
3.1 OVERALL WIRING DIAGRAM, FLKY, PONS, CNNB, LOMB, LOSB AND FG ASSEMBLIES



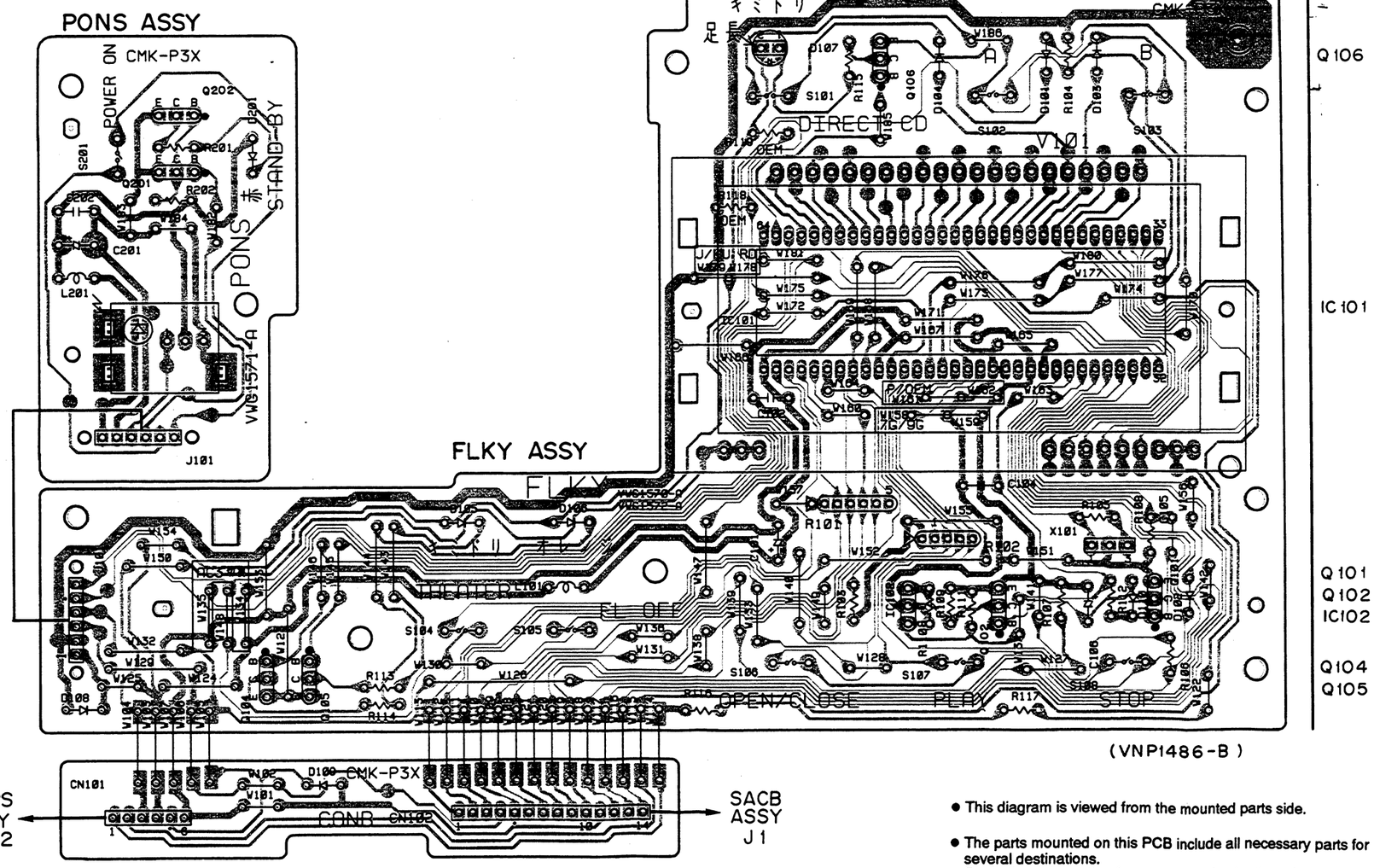




PCB – 1



● This diagram is viewed from the mounted parts side.



● This diagram is viewed from the mounted parts side.

● The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

3.2 SYPS ASSY

- Power supply assembly warnings
  For this power supply assembly, over current is detected by resistor and transistor.
  The ± 14V wiring is short by the thyristor and all output generation is stopped.

- When the circuit is short and the power goes OFF, unplug the unit and let it discharge for 10 – 30 seconds and then plug it again and turn on power.

- When output is stopped, a 120V charge remains for about one minute. Be careful not to touch anything.

– Detection circuit (reference) –

For SPDL use	+14V	Q34, R51
	+14V	Q36, R52
	– 14V	Q38, R53
	+5V	Q28, R54
	– 5V	Q37, R55
	thyristor	THY20

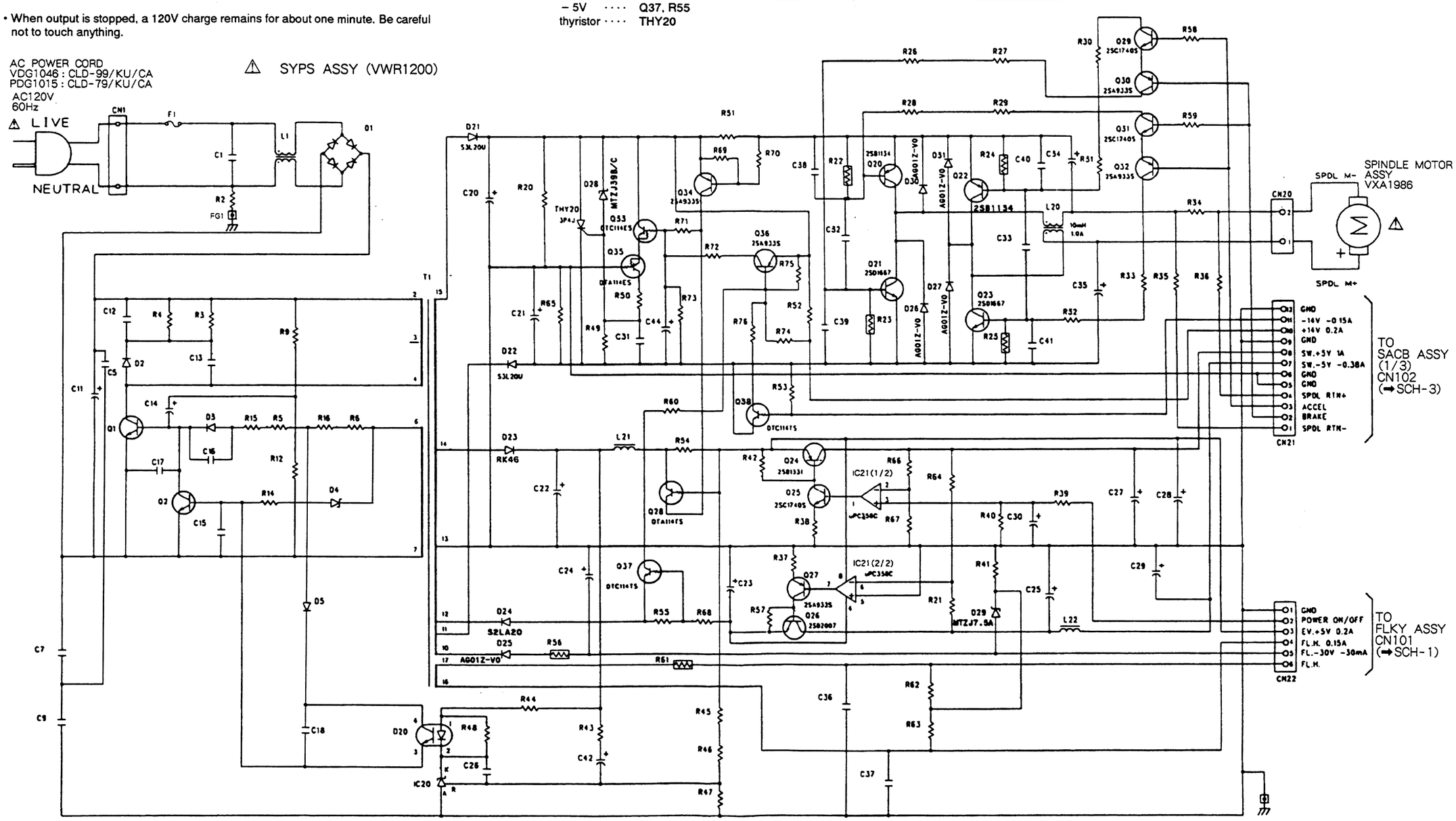
- NOTE FOR FUSE REPLACEMENT

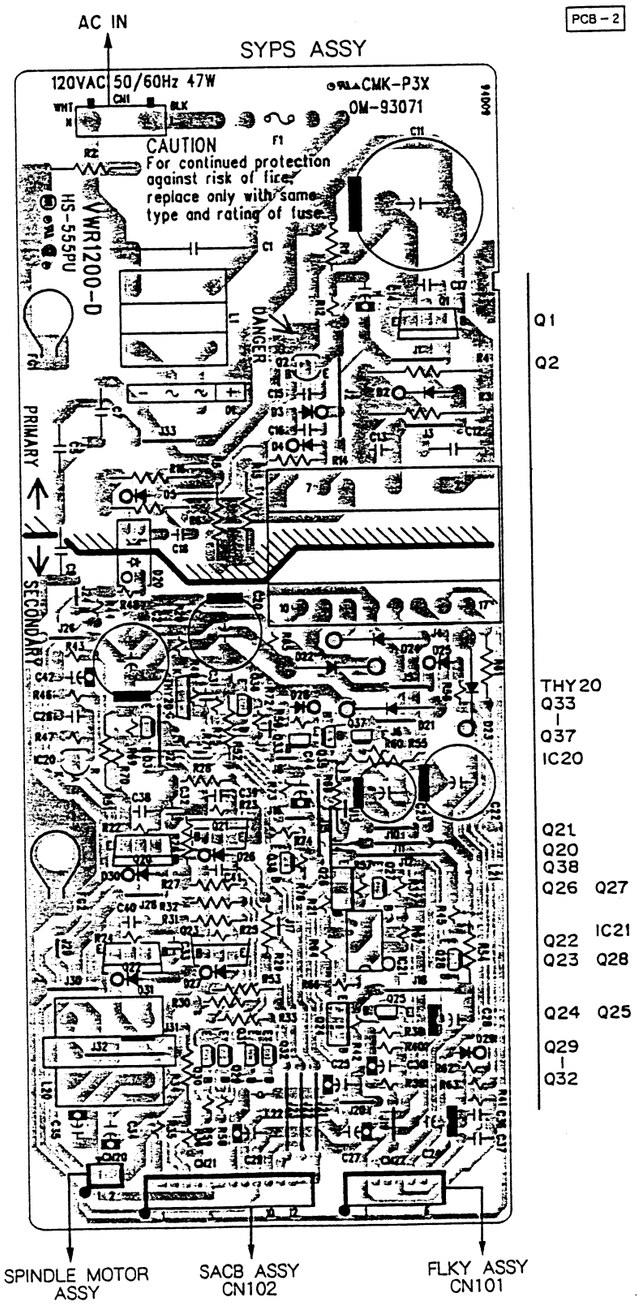
CAUTION ——
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE,
REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.

SCH – 2

AC POWER CORD
VDG1046 : CLD-99/KU/CA
PDG1015 : CLD-79/KU/CA
AC120V
60Hz

⚠ SYPS ASSY (VWR1200)





● This diagram is viewed from the mounted parts side.

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance:(F):±1%, (G):±2%, (K):±10%, (M):±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit : p:pF or μF unless otherwise noted.
   Ratings : capacitor (μF) / voltage (V) unless otherwise noted.
   Rated voltage : 50V except for electrolytic capacitors.
5. **COILS:**
   Unit : m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ←V:
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦mA or ←mA:
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   - ⊘ or ⊘ : Adjusting point.
   - ◀ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH – □ ON THE SCHEMATIC DIAGRAM:**
   - SCH–□ indicates the drawing number of the schematic diagram.
     (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):

FLKY ASSY
- S101 : DIRECT CD
- S102 : DISC SIDE A
- S103 : DISC SIDE B
- S104 : FILM MODE
- S105 : FL OFF
- S106 : OPEN/CLOSE(▲)
- S107 : PLAY/PAUSE(▶/❚❚)
- S108 : STOP(■)

PONS ASSY
- S201 : POWER(STANDBY/ON)

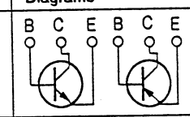
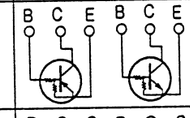
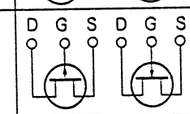
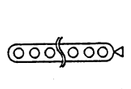
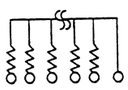
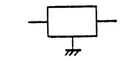
LOSB ASSY
- S1 : SW1
- S2 : SW2
- S3 : SW3

NOTE FOR
1. Part numb diagrams.
2. A compar diagrams

Symbol i Diagrams
B C
B
D

NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

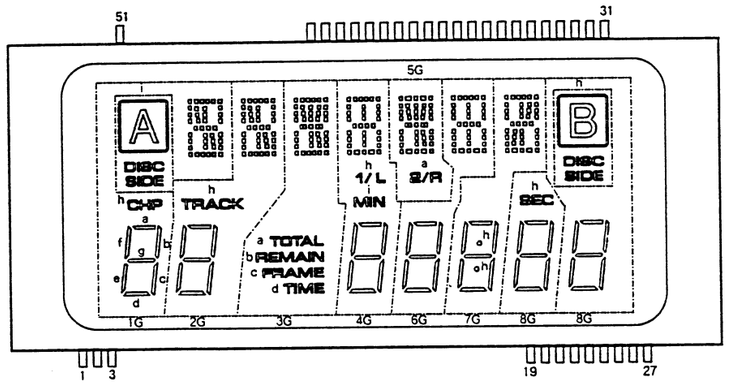
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

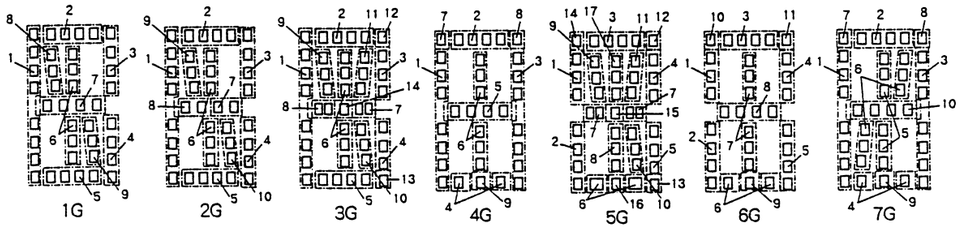
FL INFORMATION

VAW1037 (V101:FLKY ASSY)

- FL TUBE

- ANODE GRID ASSIGNMENT





- PIN ASSIGNMENT

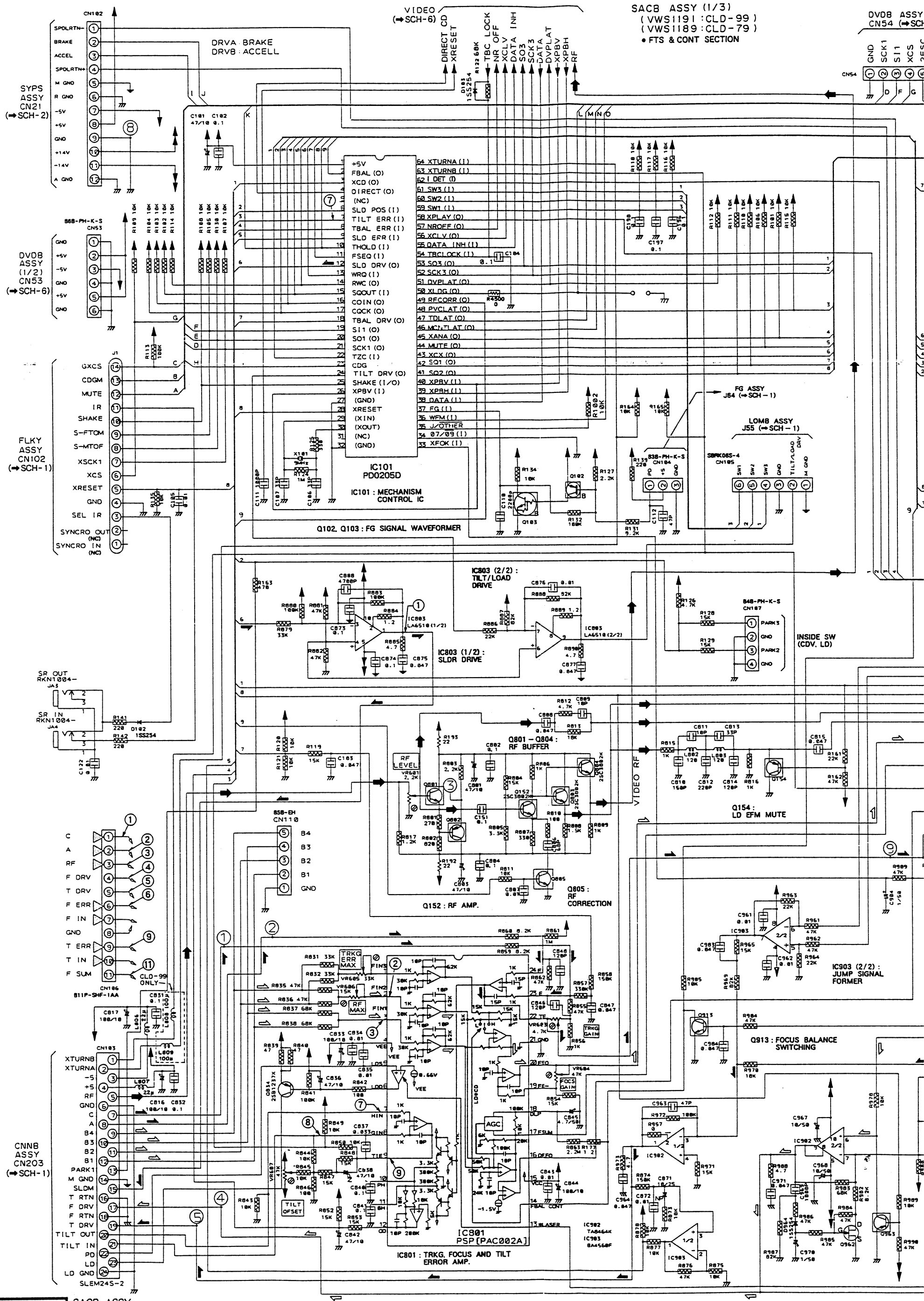
Pin No.	Assignment	Pin No.	Assignment
1	F1	28	NL
2	F1	29	NL
3	F1	30	NL
4	NL	31	g
5	NL	32	h
6	NL	33	i
7	NL	34	j
8	NL	35	k
9	NL	36	l
10	NL	37	m
11	NL	38	n
12	NL	39	o
13	NL	40	p
14	NL	41	q
15	NL	42	r
16	NL	43	9G
17	NL	44	8G
18	NL	45	7G
19	f	46	6G
20	e	47	5G
21	d	48	4G
22	c	49	3G
23	b	50	2G
24	a	51	1G
25	F2	52	NL
26	F2	53	NL
27	F2	54	NL

F1, F2 : Filament
a~r : Anode
1G~9G : Grid
NL : No lead

- ANODE GRID ASSIGNMENT & PIN ASSIGNMENT

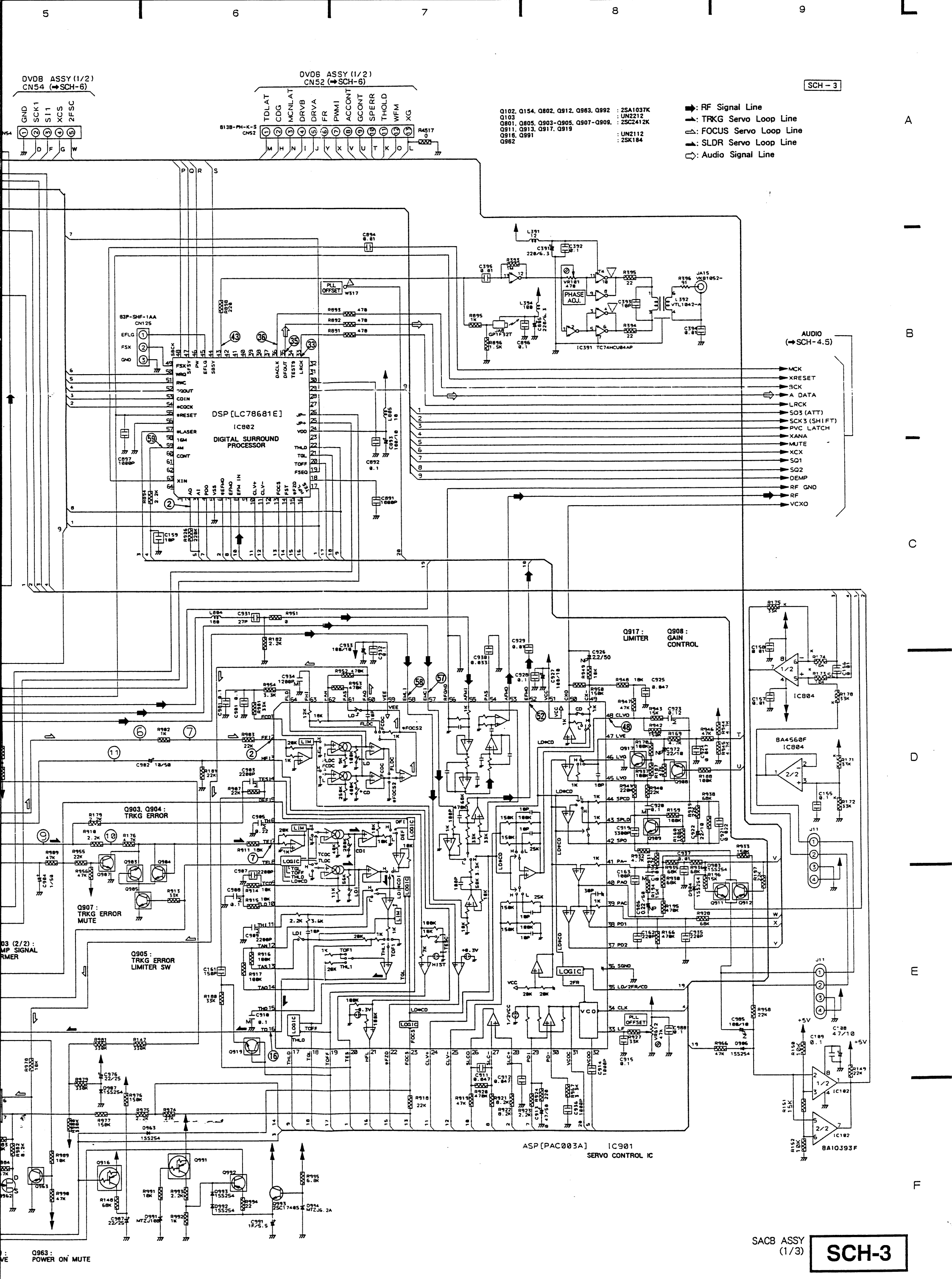
	1G	2G	3G	4G	5G	6G	7G	8G	9G
a	a	a	TOTAL	a	2/R	a	a	a	a
b	b	b	REMAIN	b	17	b	b	b	b
c	c	c	FRAME	c	16	c	c	c	c
d	d	d	TIME	d	15	d	d	d	d
e	e	e	14	e	14	e	e	e	e
f	f	f	13	f	13	f	f	f	f
g	g	g	12	g	12	g	g	g	g
h	CHP	TRACK	11	1/L	11	11	°h °h	SEC	B DISC SIDE
i	A DISC SIDE	10	10	MIN	10	10	10		
j	9	9	9	9	9	9	9		
k	8	8	8	8	8	8	8		
l	7	7	7	7	7	7	7		
m	6	6	6	6	6	6	6		
n	5	5	5	5	5	5	5		
o	4	4	4	4	4	4	4		
p	3	3	3	3	3	3	3		
q	2	2	2	2	2	2	2		
r	1	1	1	1	1	1	1		

3.3 SACB ASSY(1/3 : FTS & CONT SECTION)



SCH-3

SACB ASSY (1/3)


SCH - 3
DVDB ASSY (1/2)
CN54 (➡SCH-6)
GND SCK1 S11 XCS 2FSC
DVDB ASSY (1/2)
CN52 (➡SCH-6)
TDLAT CDG MCNLAT DRVB DRVA FR PWM1 ACCONT GCONT SPERR THOLD WFM XG
M H N I J Y X V U T K O L
Q102, Q154, Q802, Q912, Q963, Q992 : 2SA1037K
Q103 : UN2212
Q801, Q805, Q903-Q905, Q907-Q909, Q911, Q913, Q917, Q919 : 2SC2412K
Q916, Q991 : UN2112
Q962 : 2SK184
➡: RF Signal Line
➡: TRKG Servo Loop Line
➡: FOCUS Servo Loop Line
➡: SLDR Servo Loop Line
⇨: Audio Signal Line
DSP [LC78681E]
IC802
DIGITAL SURROUND PROCESSOR
IC901 TC74HCU04AP
PHASE ADJ.
PLL OFFSET
AUDIO (➡SCH-4,5)
MCK
XRESET
SCK
A DATA
LRCK
SO3 (ATT)
SCK3 (SHIFT)
PVC LATCH
XANA
MUTE
XCX
SQ1
SQ2
DEMP
RF GND
RF
VCXO
Q917 : LIMITER
Q908 : GAIN CONTROL
IC804
8A4560F
IC804
Q903, Q904 : TRKG ERROR
Q907 : TRKG ERROR MUTE
Q905 : TRKG ERROR LIMITER SW
Q963 : POWER ON MUTE
ASP [PAC003A] IC901
SERVO CONTROL IC
8A10393F
SACB ASSY (1/3)
SCH-3

WAVEFORMS AND VOLTAGE
• FTS AND CONT SECTION

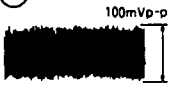
Note : (No) in the table correspond to the pin number.
Measurement condition : In case when (D. audio) is written, at time when disc that has digital audio recording is played.

IC801(PAC002A)	IC802(LC78681E)	IC803(LA6510)	IC901(PAC003A)	CN106	IC101 (PD0205D)
②, ③ 1mS/Div. 16mVp-p AC mode	② 0.1μS/Div. 4.3Vp-p AC mode(D.audio)	① 2mS/Div. 1.8Vp-p DC mode	② 0.2mS/Div. 74mVp-p 0V DC mode	①, ② 5mS/Div. 65mVp-p 0V DC mode	⑦ 1V/Div 5ms/Div Approx. 1.2V 0V DC mode(Sldr err)
⑦, ⑧ 1mS/Div. 67mVp-p 0V DC mode	㉝ 10μS/Div. 4.2Vp-p AC mode(D.audio)		⑦ 0.2mS/Div. 74mVp-p 0V DC mode	③ 0.5mS/Div. 300mVp-p AC mode	
⑨ 5mS/Div. 0.1Vp-p 0V DC mode	㉟ 0.2μS/Div. 4.4Vp-p AC mode(D.audio)		⑯ 0.2mS/Div. 0.61Vp-p DC mode 0V	④ 5mS/Div. 15Vp-p 0V DC mode	
	㊱ 0.2μS/Div. 4.5Vp-p AC mode(D.audio)		㊽ 50μS/Div. 6.2Vp-p 0V DC mode	⑤ 5mS/Div. 5.8Vp-p 0V DC mode	
	㊸ 0.1μS/Div. 4.5Vp-p AC mode(D.audio)		㊷ 0.2μS/Div. 2.1Vp-p AC mode	⑥ 5mS/Div. 3.5Vp-p 0V DC mode	
	㊾ 0.1μS/Div. 2Vp-p AC mode(D.audio)		㊼ 1mS/Div. 0.53Vp-p DC mode 0V	⑨ 5mS/Div. 1.25Vp-p DC mode 0V	
			㊽ 0.2mS/Div. 0.32Vp-p 0V DC mode	⑪ 10mS/Div. 1.7Vp-p DC mode	

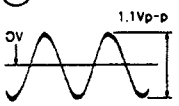
WAVEFORMS OF AUDIO SECTION

Note : (No.) in the table correspond to the pin number.

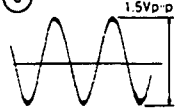
IC209 (CA0002AM)

(2) H: 5mS/Div


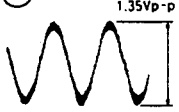
AC mode

(21) H: 5mS/Div.


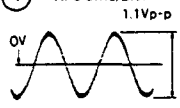
DC mode AC mode

(3) H: 0.5mS/Div.


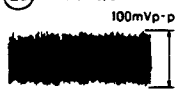
AC mode

(22) H: 0.5mS/Div.


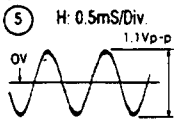
AC mode

(4) H: 0.5mS/Div.


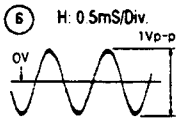
DC mode

(23) H: 5mS/Div


AC mode

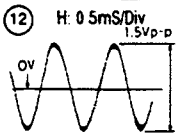
(5) H: 0.5mS/Div.


DC mode

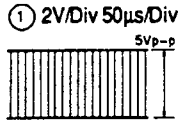
(6) H: 0.5mS/Div.


DC mode

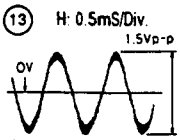
IC203 (PD0116A)

(12) H: 0.5mS/Div.


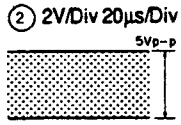
DC mode

(1) 2V/Div 50μs/Div


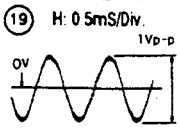
DC mode (D.audio)

(13) H: 0.5mS/Div.


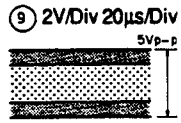
DC mode

(2) 2V/Div 20μs/Div


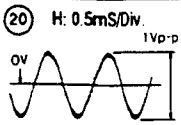
DC mode (POWER ON)

(19) H: 0.5mS/Div.


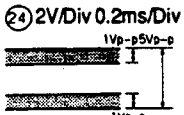
DC mode

(9) 2V/Div 20μs/Div


DC mode (D.audio)

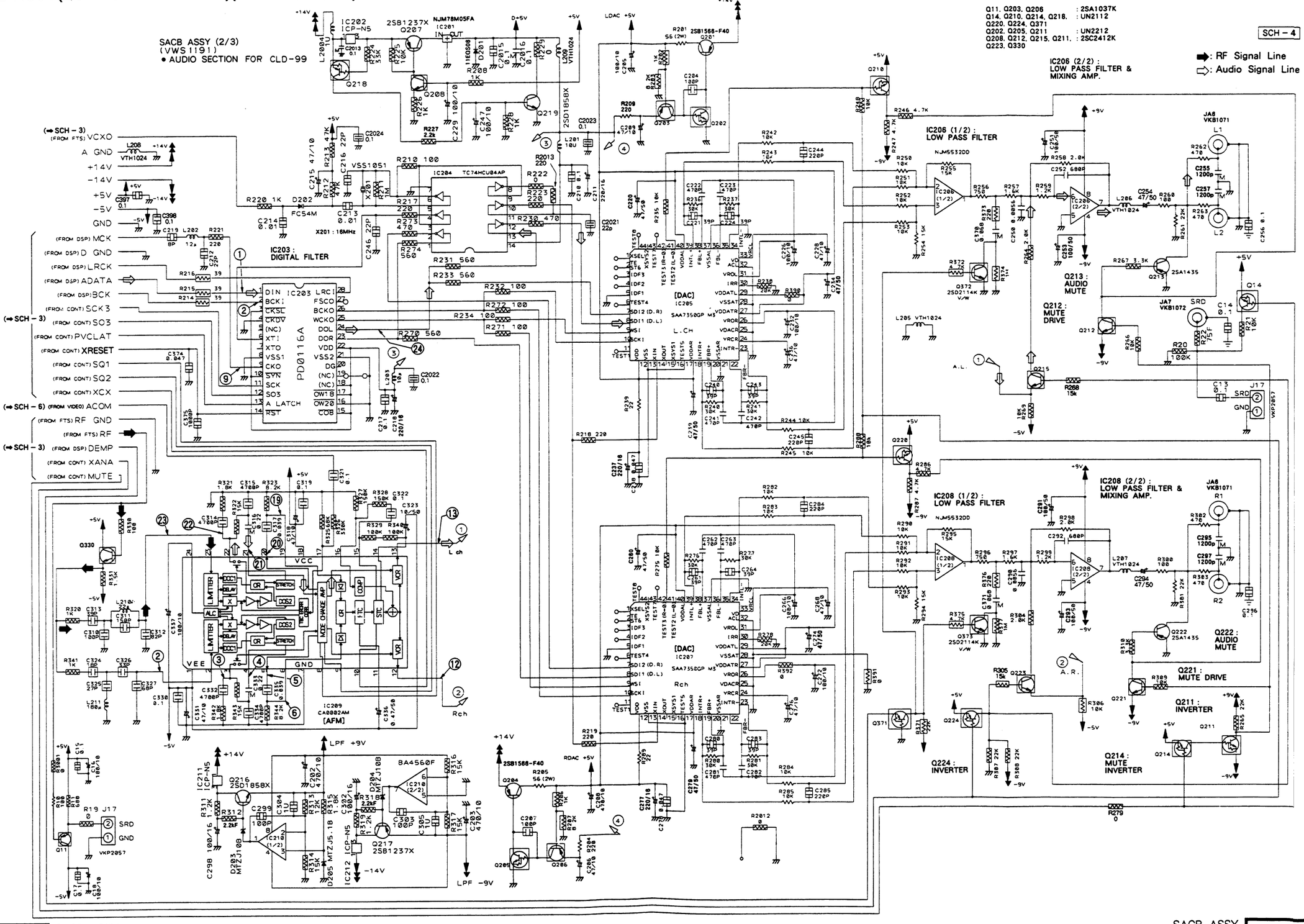
(20) H: 0.5mS/Div.


DC mode

(24) 2V/Div 0.2ms/Div


DC mode (D.audio)

3.4 SACB ASSY(2/3 : AUDIO SECTION)(CLD-99/KU/CA)



3.5 SACB ASSY(2/3 : AUDIO SECTION)(CLD-79/KU/CA)

SACB ASSY (2/3)
(VWS1189)
• AUDIO SECTION FOR CLD-79

SCH – 5

➡: RF Signal Line
⇨: Audio Signal Line

A GND
+14V
-14V
+5V
-5V
GND

TO FTS (⇒ SCH – 3): RF GND, VCXO, AFM (RF)
TO DSP (⇒ SCH – 3): MCK, ADATA, BCK, LRCK
TO VIDEO (⇒ SCH – 6): ACOM
TO CONT (⇒ SCH – 3): PVC LATCH, SCK3, SO3, RESET, XANA, MUTE, SQ1, SQ2, XCX

IC201 PD2029A: VDX, GND, C, LZ, MCK, LATCH, SHIFT, ATT, OSCE, RESET, DATA, BCK, LRCK, VDD, S/P, RZ, TEST, VDA, RO, GNDA, GNDA, VDA, LO, GNDX, X1, X0
X201 : 16MHz

IC202 BA4560F
IC351 CA0002AM
[AFM]
IC206 NJM78L08A
IC207 NJM79L08A

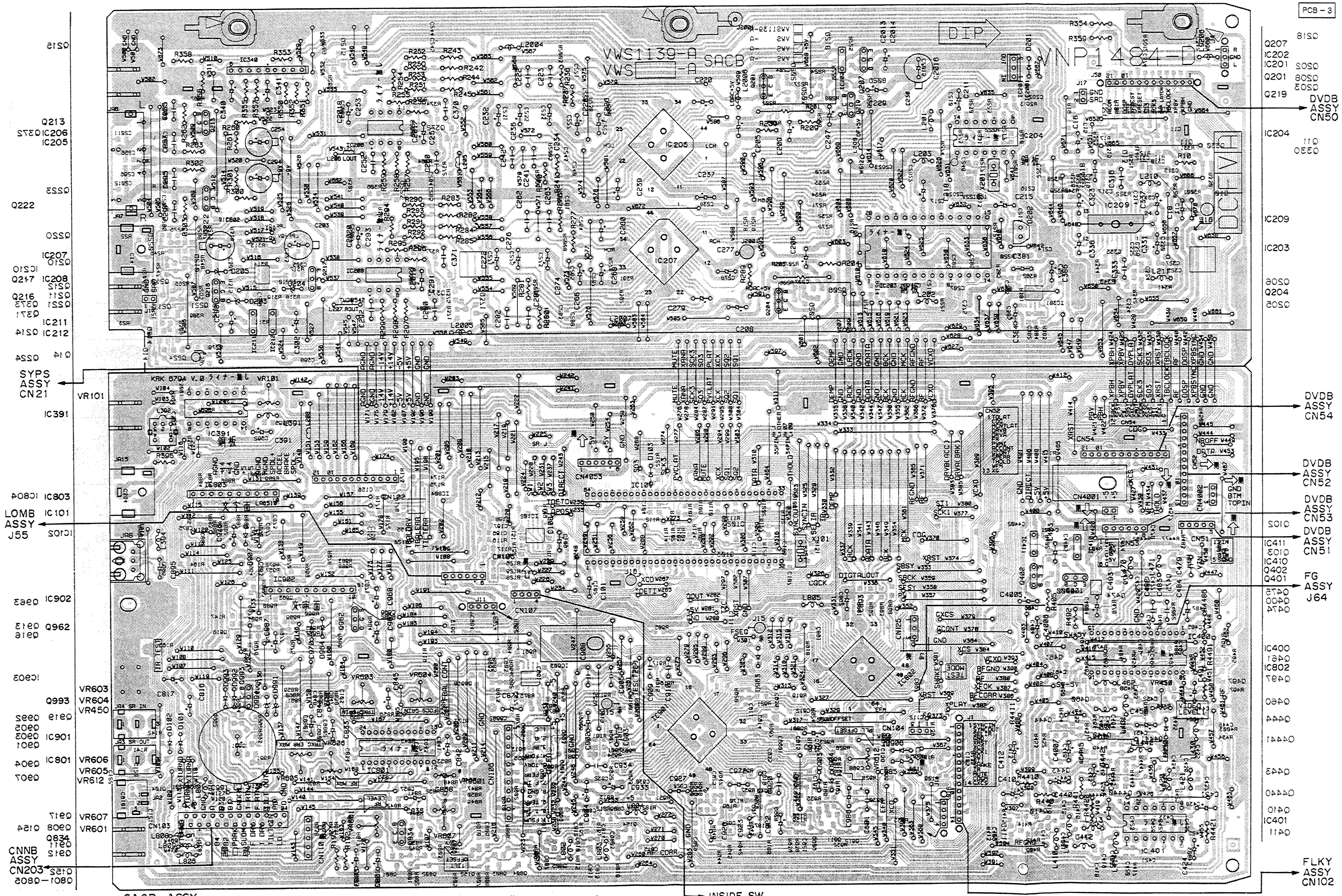
LIMITTER, DCC1, DELAY, X, OR, STRETCH, DOS2, ALC, MODE CHANGE AMP, COMP, FTC, STC, VCR, TBC ERROR CORR, VCC, VEE, GND

LOUT, ROUT
JA5 VKB1071-A
JA7 VKB1072-A
CHASSIS GND

SACB ASSY (2/3) (CLD-79/KU/CA) SCH-5

PCB-3

• FOR CLD-99/KU/CA



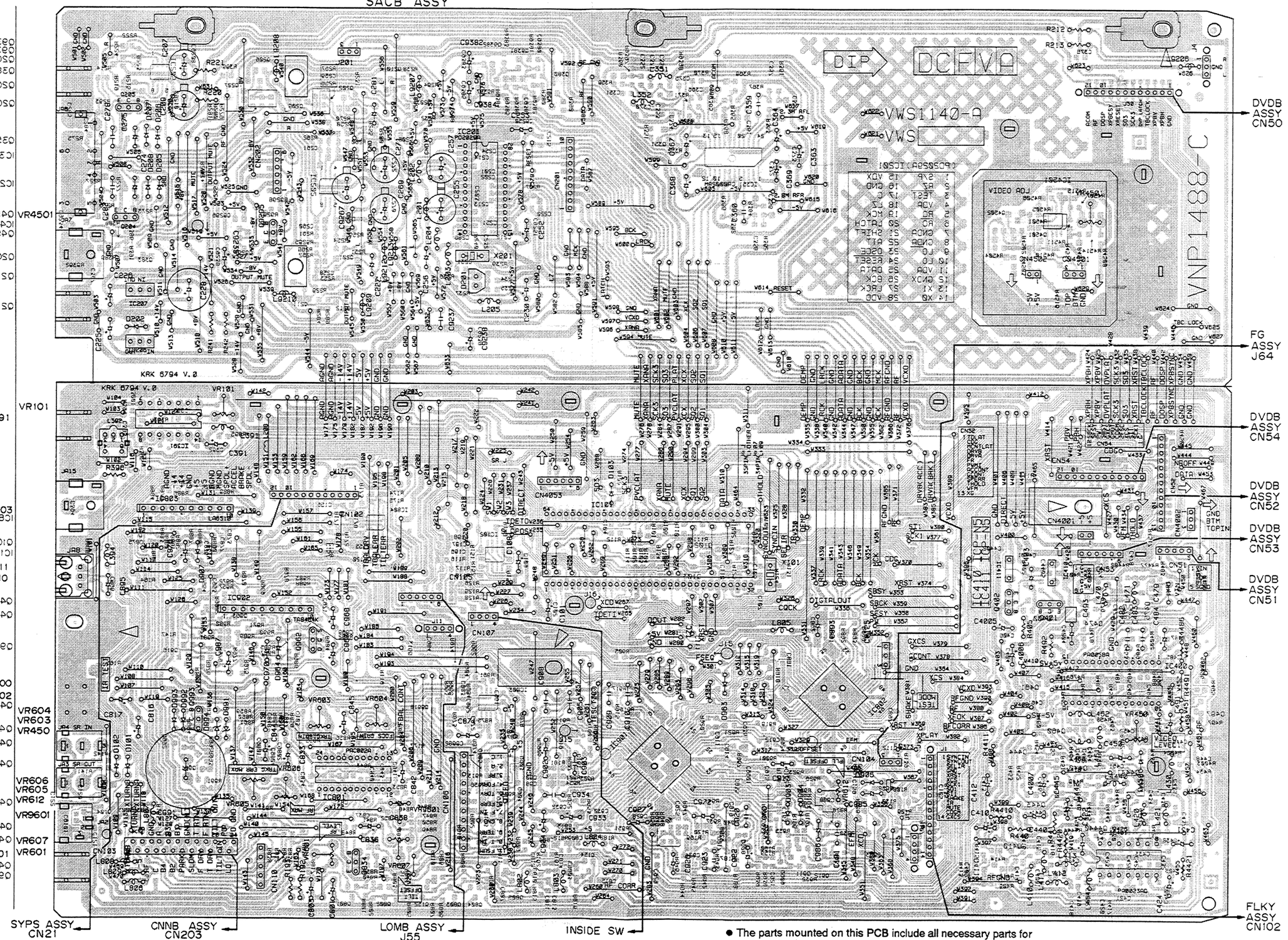
SACB ASSY

• The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

• This diagram is viewed from the mounted parts side.

• FOR CLD-79/KU/CA

SACB ASSY


DVDB ASSY CN50
FG ASSY J64
DVDB ASSY CN54
DVDB ASSY CN52
DVDB ASSY CN53
DVDB ASSY CN51
FLKY ASSY CN102
SYPS ASSY CN21
CNNB ASSY CN203
LOMB ASSY J55
INSIDE SW
VR4501
VR101
VR604
VR603
VR450
VR606
VR605
VR612
VR9601
VR607
VR601
IC391
IC803
IC804
IC101
IC411
IC410
Q402
IC902
Q401
Q962
IC400
IC802
Q993
IC901
IC801
Q834
IC401
IC207
Q205
Q204
IC206
Q205
IC201
Q204
IC207
IC206
Q204
IC207
IC206
Q204
IC207
IC206

3.6 SACB ASSY(3/3), DVDB ASSY(1/2)(VIDEO SECTION)

WAVEFORMS OF VIDEO SECTION

Note : (No.) in the table correspond to the pin number.

Measurement condition : Where (Color bars) is written, at time when color bar screen of disc is being played.
Where (Still) is written, at time of still.

IC400(PA0058A)

(14) 20μS/Div. 0.9Vp-p — AC mode(Color bars)

(21) 20μS/Div. 0.9Vp-p — AC mode(Color bars)

IC401(PA0023AD)

(10) 20μS/Div. 0.24Vp-p — AC mode(Color bars)

IC500(PD0146A)

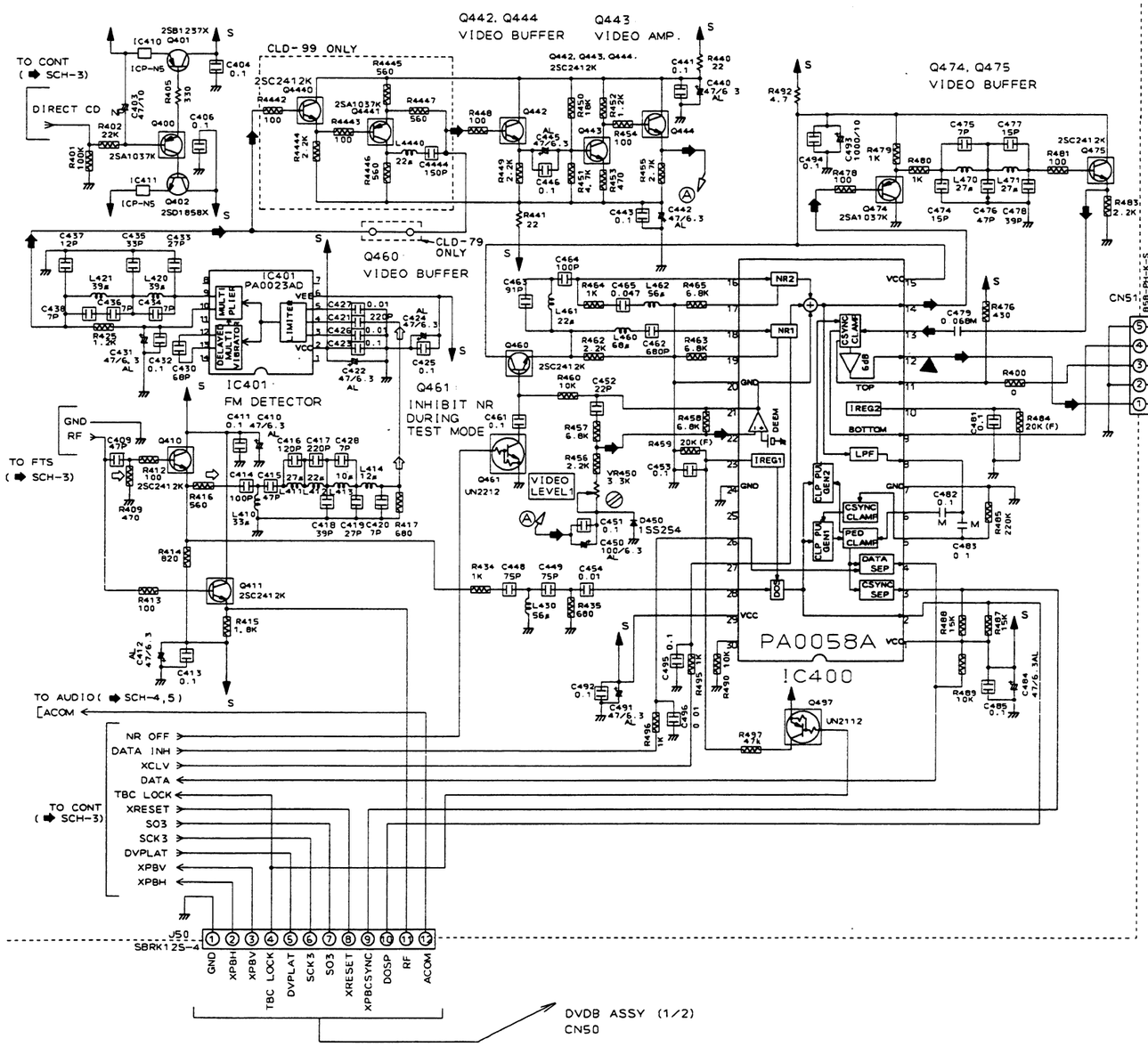
(47) 20μS/Div. 1.7Vp-p — AC mode(Color bars)

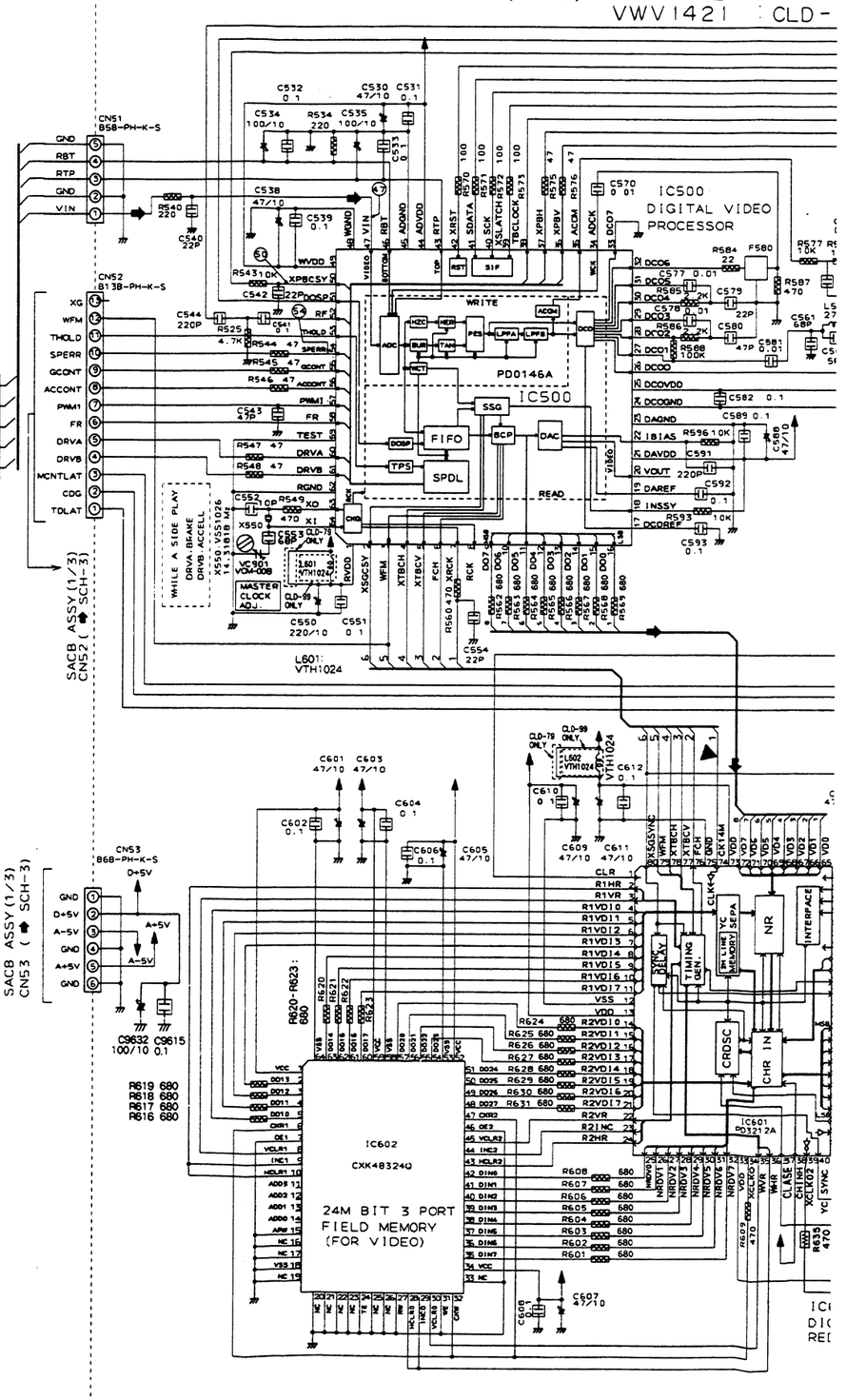
(50) 50μS/Div. 5.2Vp-p — AC mode[Color bars / Still]

(54) 50μS/Div. 2.5Vp-p — AC mode[Color bars / Still]

SACB ASSY (3/3) VWS1191 : CLD-99
(VIDEO SECTION) VWS1189 : CLD-79

DVDB ASSY (1/2) VWV1420 : CLD-
VWV1421 : CLD-





SCH-6 SACB ASSY (3/3), DVDB ASSY (1/2)

VWS1191 : CLD-99
VWS1189 : CLD-79

DVDB ASSY (1/2) VWV1420 : CLD-99 VWV1421 : CLD-79

SCH-6

RF SIGNAL LINE
VIDEO SIGNAL LINE

SACB ASSY (3/3) J50

CN50 SBRK12S-4
ACOM
RF
DOSP
XPBCSYNC
XRESET
SO3
SCK3
DVPLAT
TBC LOCK
XPBV
XPBH
GND

Q474, Q475 VIDEO BUFFER

Q793-Q794 VIDEO BUFFER

Q794, Q795 2SC1740S

Q714, Q796 2SC2412K

Q793 2SA1037K

VIDEO OUT JA1 VKB1061

Q681 2SA1037K

CN51 B5B-PH-K-S

CN52 B13B-PH-K-S
XG
WFM
THOLD
SPERR
GCONT
ACCONT
PWM1
FR
DRVA
DRVB
MCNTLAT
CDG
TDLAT

CN53 B6B-PH-K-S
GND
D+5V
A-5V
GND
A+5V
GND

SACB ASSY (1/3) CN52 (SCH-3)

SACB ASSY (1/3) CN53 (SCH-3)

IC500 DIGITAL VIDEO PROCESSOR

PD0146A IC500

WRITE
READ
FIFO
SPDL
SSG
DAC
BCP
TPS

WHILE A SIDE PLAY
DRIVE BRAKE
DRIVE ACCELL

MASTER CLOCK ADJ.

L601: VTH1024

IC602 CXK48324Q
24M BIT 3 PORT FIELD MEMORY (FOR VIDEO)

IC601 PD3212A
DIGITAL NOISE REDUCTION

IC604 CXD1171M
D/A CONVERTER

IC650 ON SCREEN DISPLAY

IC605 TC74HC4053AF-TL

IC400 PA0058A

Q497 UN2112

DTC124EK

SYNC LEVEL ADJ

V. SYNC LEVEL ADJ

VIDEO LEVEL ADJ

CSYNC
YCVSYNC
CDG
TDLAT
SCK3
SO3
YCSYNC
DATA
CLK
VSYNC

TO DVDB ASSY (2/2) (➡ SCH-7)

CN54 B5B-PH-K-R
2FSC
XCS
SI1
SCK1
GND

SACB ASSY (1/3) CN54 (SCH-3)

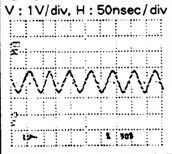
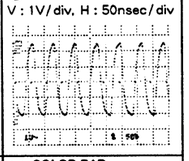
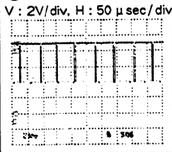
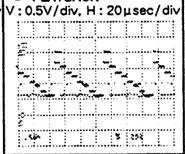
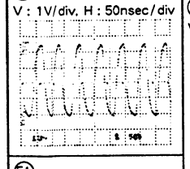
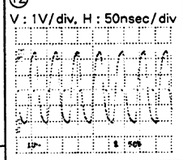
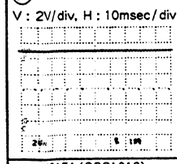
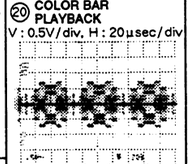
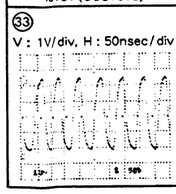
SACB ASSY (3/3), DVDB ASSY (1/2)

SCH-6

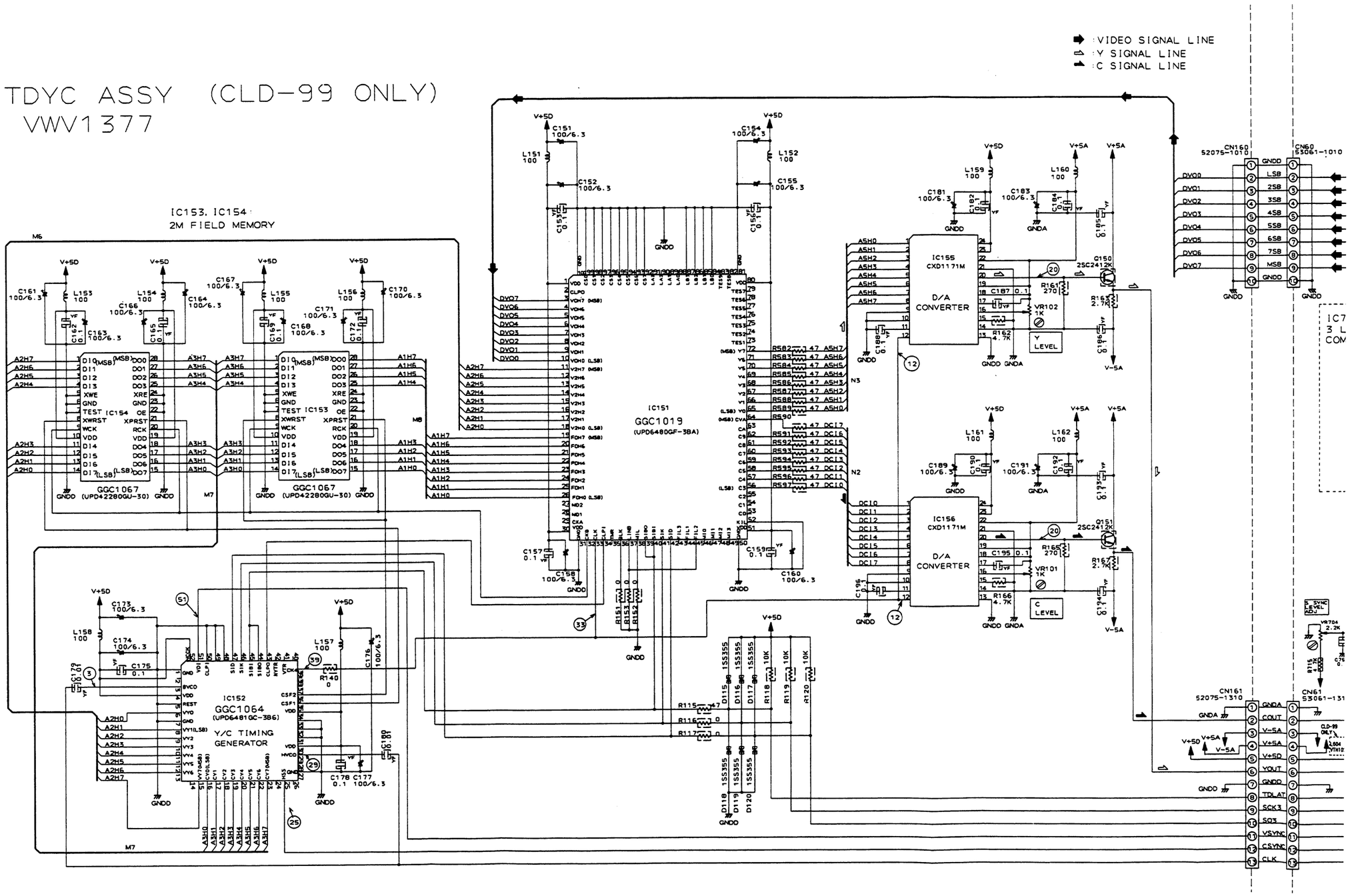
3.7 DVDB ASSY(2/2), TDYC ASSY

WAVEFORMS OF TDYC ASSY

Note : (No.) in the table correspond to the pin number.

IC152 (GGC1064)	IC155 (CXD1171M)
(3)(29) V : 1V/div, H : 50nsec/div 	(12) V : 1V/div, H : 50nsec/div 
(25) V : 2V/div, H : 50 µsec/div 	(20) COLOR BAR PLAYBACK V : 0.5V/div, H : 20µsec/div 
(39) V : 1V/div, H : 50nsec/div 	IC156 (CXD1171M) (12) V : 1V/div, H : 50nsec/div 
(51) V : 2V/div, H : 10msec/div 	(20) COLOR BAR PLAYBACK V : 0.5V/div, H : 20µsec/div 
IC151 (GGC1019)	
(33) V : 1V/div, H : 50nsec/div 	

TDYC ASSY (CLD-99 ONLY)
VWV1377



NLY)

: VIDEO SIGNAL LINE
: Y SIGNAL LINE
: C SIGNAL LINE

DVDB ASSY (2/2)
VWV1420 : CLD-99
VWV1421 : CLD-79

SCH-7

CLD-79 ONLY

IC701 : 3 LINE DIGITAL COMB FILTER

IC701 CXD2023Q LOGICAL OPERATION ADAPTIVE FILTER OPERATION

IC151 GGC1019 (UPD6480GF-3BA)

IC155 CXD1171M D/A CONVERTER

IC156 CXD1171M D/A CONVERTER

IC705 TC74HC4053AF

CN160 52075-1010 — CN60 53061-1010

CN161 52075-1310 — CN61 53061-1310

Y LEVEL

C LEVEL

Y LEVEL ADJ

C LEVEL ADJ

V SYNC LEVEL ADJ

H SYNC LEVEL ADJ

V SYNC LEVEL ADJ

Q780-Q782 : Y-SIGNAL BUFFER

Q781 2SC1740S

Q782 2SA1037K

Q783 2SC1740S

Q784 2SC1740S

Q780-Q782 C-SIGNAL BUFFER

JA5 VKN1078

FROM DVDB ASSY (1/2) (➡ SCH-6)

LSB 2SB 3SB 4SB 5SB 6SB 7SB MSB

YCVSYNC YCSYNC CDG TDLAT SCK3 SO3 VSYNC CSYNC CLK

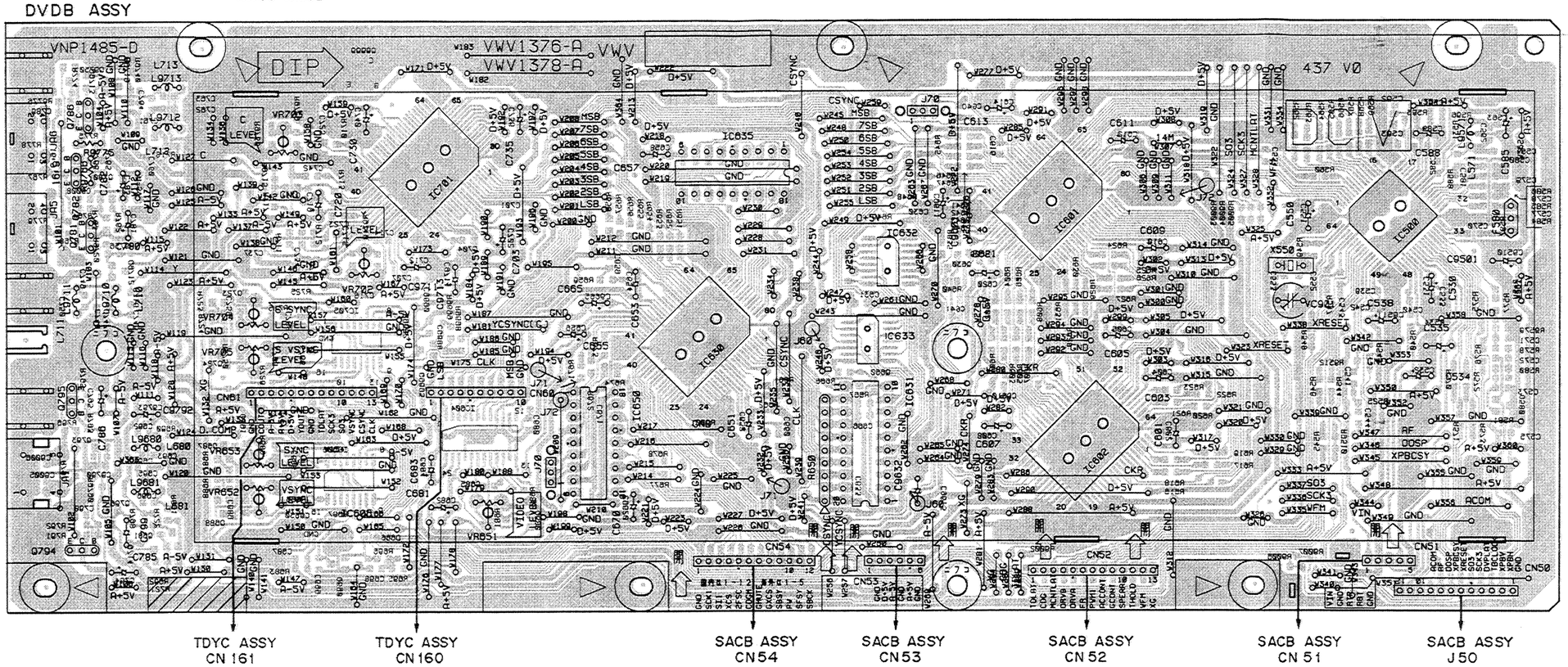
FROM DVDB ASSY (1/2) (➡ SCH-6)

DVDB ASSY (2/2), TDYC ASSY

SCH-7

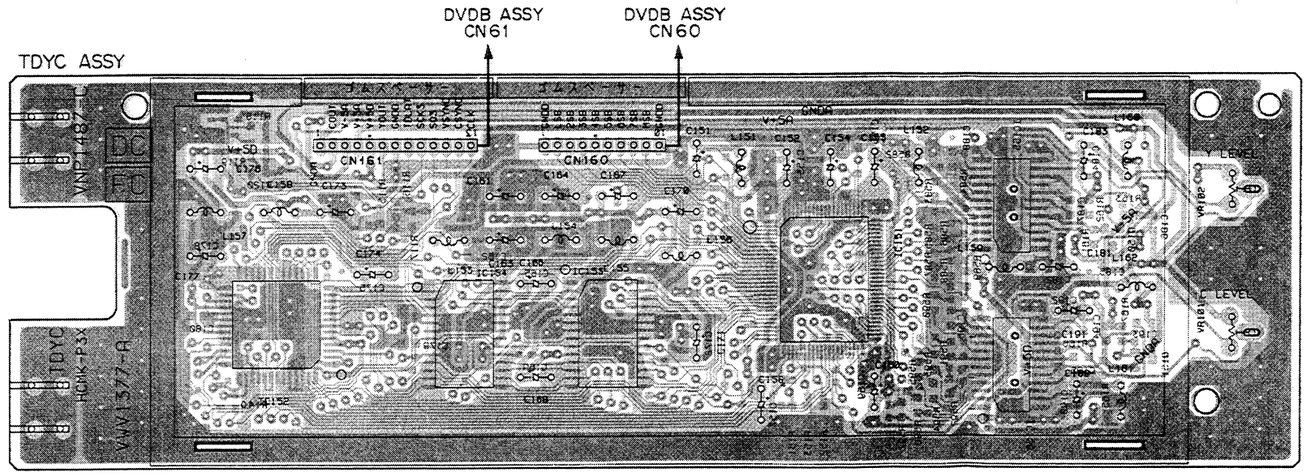
PCB – 5

DVDB ASSY



- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

TDYC ASSY



- This diagram is viewed from the pink colored foil side.
- This PCB is double sided.

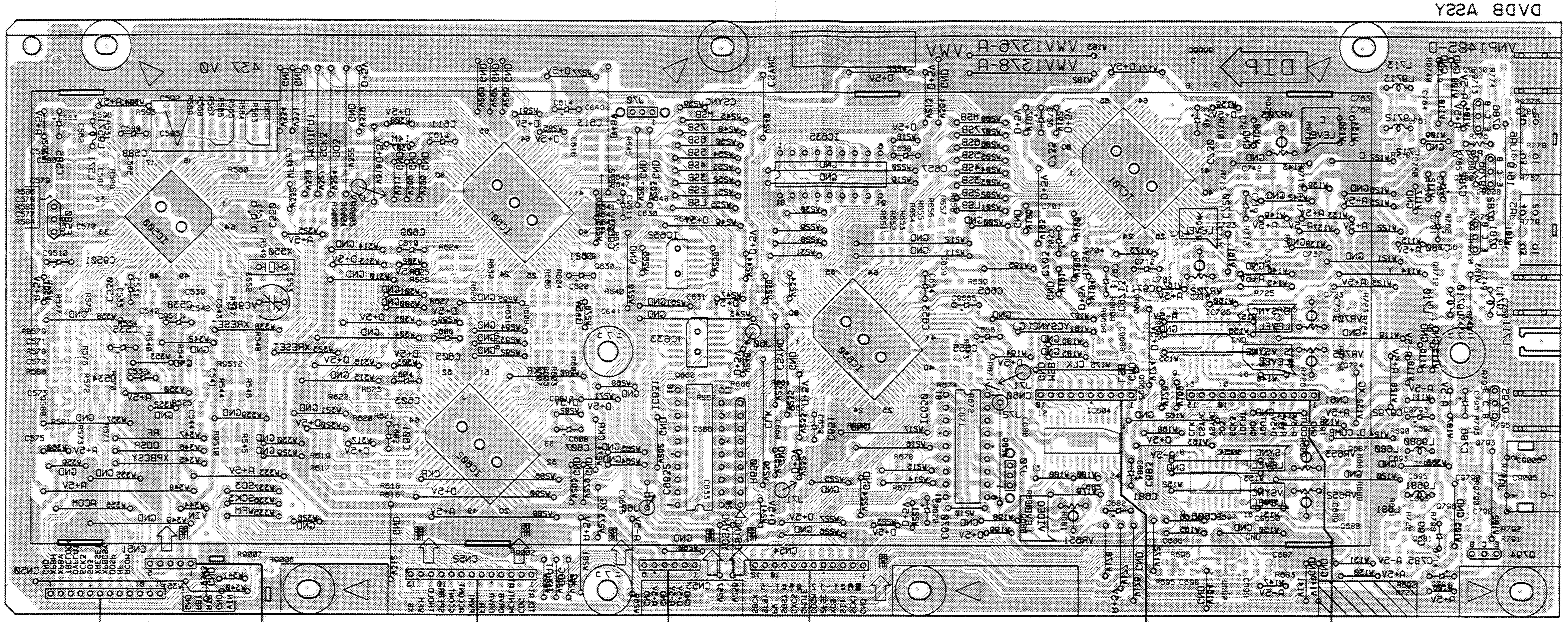
6 5 4 3 2 1

Q580 IC500 IC601 IC602 Q630 IC632 IC633 IC631 IC635 IC630 IC650 Q680 IC604 IC701 IC705 Q710 Q711 Q723 Q724 IC605 Q690 Q687 Q688 Q780 Q786 Q796 Q781 Q782 Q681 Q795 Q794 Q793

TC901 VR651 VR702 VR703 VR653 VR704 VR705 VR652

DVDB ASSY

A



B

SACB ASSY J50

SACB ASSY CN51

SACB ASSY CN52

SACB ASSY CN53

SACB ASSY CN54

TDYC ASSY CN160

TDYC ASSY CN161

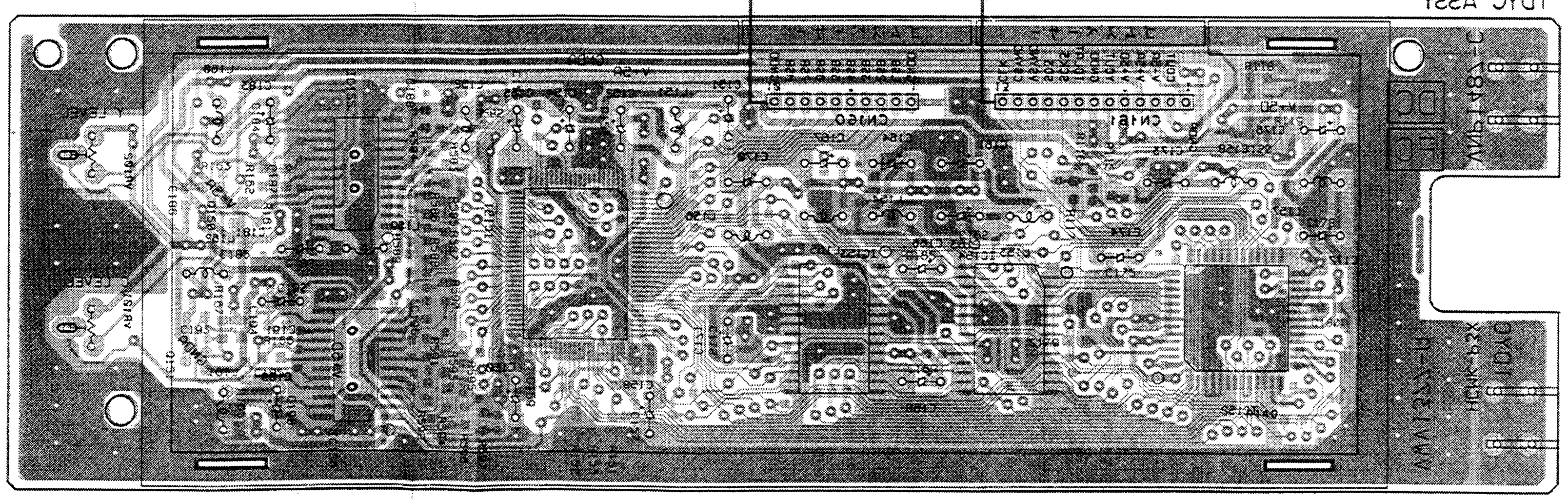
- This diagram is viewed from the foil side.

C

DVDB ASSY CN60

DVDB ASSY CN61

TDYC ASSY



D

VR102 VR101

Q151 Q150 IC155 IC156 IC151 IC153 IC154 IC152

- This diagram is viewed from the gray colored foil side.
- This PCB is double sided.

6 5 4 3 2 1

4. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits(any digit apart from 0), such as 560 ohm and 47k ohm(tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ····· RD1/8PM 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits(such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
⚠		SYPS ASSY	VWR1200
		SACB ASSY(CLD-99/KU/CA)	VWS1191
		SACB ASSY(CLD-79/KU/CA)	VWS1189
		DVDB ASSY(CLD-99/KU/CA)	VWV1420
		DVDB ASSY(CLD-79/KU/CA)	VWV1421
		TDYC ASSY(CLD-99/KU/CA ONLY)	VWV1377
NSP		FLKB ASSY(CLD-99/KU/CA)	VWM1582
		├ FLKY ASSY(CLD-99/KU/CA)	VWG1644
NSP		└ PONS ASSY	VWG1571
NSP		FLKB ASSY(CLD-79/KU/CA)	VWM1583
		├ FLKY ASSY(CLD-79/KU/CA)	VWG1645
NSP		└ PONS ASSY	VWG1571
NSP		MACB ASSY	VWM1420
NSP		├ CNNB ASSY	VWG1469
NSP		├ LOMB ASSY	VWG1470
NSP		├ LOSB ASSY	VWG1471
NSP		└ FG ASSY	VWG1472

SYPS ASSY

SEMICONDUCTORS

	IC21	UPC358C
	Q27, Q30, Q32, Q34, Q36	2SA933S
	Q20, Q22	2SB1134
	Q24	2SB1331
	Q25, Q29, Q31	2SC1740S
	Q21, Q23	2SD1667
	Q26	2SD2007
	Q35	DTA114ES
	Q28	DTA114TS
	Q33	DTC114ES
	Q37, Q38	DTC114TS
	D25-D27, D30, D31	AG01Z-V0
	D28	MTZJ39B
	D29	MTZJ7.5A
	D23	RK46
	D24	S2LA20
	D21, D22	S3L20U
	THY20	3P4J

COIL

	L20	(10 μH)	VTL1008

RESISTORS

R22-R25	(47Ω)	VCN1033
R56	(15Ω)	VCN1034
R61	(4.7Ω)	VCN1035

SACB ASSY(CLD-99/KU/CA)

SEMICONDUCTORS

	IC102	BA10393F
	IC210, IC804, IC903	BA4560F
	IC209	CA0002AM
	IC202, IC211, IC212, IC410, IC411	ICP-N5
	IC803	LA6510
	IC802	LC78681E
	IC206, IC208	NJM5532DD
	IC201	NJM78M05FA
	IC401	PA0023AD
	IC400	PA0058A
	IC801	PAC002A
	IC901	PAC003A
	IC203	PD0116A
	IC101	PD0205D
	IC205, IC207	SAA7350GP
	IC902	TA8464K
	IC204, IC391	TC74HCU04AP
	Q102, Q11, Q154, Q203, Q206	2SA1037K
	Q400, Q4441, Q474, Q802, Q912	2SA1037K
	Q963, Q992	2SA1037K
	Q213, Q222	2SA1435
	Q207, Q217, Q401, Q834	2SB1237X
	Q201, Q204	2SB1566-F40
	Q993	2SC1740S
	Q208, Q212, Q215, Q221, Q223	2SC2412K

Mark	No.	Description	Part No.
	Q330, Q410, Q411, Q442-Q444		2SC2412K
	Q4440, Q460, Q475, Q801, Q805		2SC2412K
	Q903-Q905, Q907-Q909, Q911		2SC2412K
	Q913, Q917, Q919		2SC2412K
	Q152, Q803, Q804		2SC3802K
	Q216, Q219, Q402		2SD1858X
	Q372, Q373		2SD2114K
	Q962		2SK184
	Q14, Q210, Q214, Q218, Q220		UN2112
	Q224, Q371, Q497, Q916, Q991		UN2112
	Q103, Q202, Q205, Q211, Q461		UN2212
	D201		11EQS06
	D102, D103, D450, D903, D904		1SS254
	D906, D907, D963, D964		1SS254
	D992, D993		1SS254
	D202		FC54M
	D203, D204, D991		MTZJ10B
	D205		MTZJ5. 1B
	D994		MTZJ6. 2A
COILS			
	L201, L203, L413, L805		LAU100J
	L394, L808, L809		LAU101J
	L202, L391, L414		LAU120J
	L802, L803		LAU121J
	L211, L804		LAU181J
	L2004		LAU1R0J
	L210, L412, L4440, L461		LAU220J
	L806, L807		LAU220J
	L411, L470, L471		LAU270J
	L410		LAU330J
	L420, L421		LAU390J
	L430, L462		LAU560J
	L460		LAU680J
	L205-L209		VTH1024
	L392		VTL1042
CAPACITORS			
	C420, C428, C434, C436, C438		CCSQCH070D50
	C475		CCSQCH070D50
	C219		CCSQCH080D50
	C159, C393, C809, C811		CCSQCH100D50
	C163, C204, C207, C299, C303		CCSQCH101J50
	C310, C414, C464		CCSQCH101J50
	C437		CCSQCH120J50
	C416, C814, C846, C848		CCSQCH121J50
	C474, C477		CCSQCH150J50
	C161, C311, C4444, C810		CCSQCH151J50
	C324		CCSQCH180J50
	C2021, C212, C216, C246, C452		CCSQCH220J50
	C162, C244, C245, C284, C285		CCSQCH221J50
	C417, C421, C812, C935		CCSQCH221J50
	C325, C419, C433, C931		CCSQCH270J50
	C106, C107, C326, C435, C813		CCSQCH330J50
	C221, C224, C240, C243, C261		CCSQCH390J50
	C264, C280, C283, C313, C418		CCSQCH390J50
	C478		CCSQCH390J50
	C112, C409, C415, C476, C963		CCSQCH470J50

Mark	No.	Description	Part No.
	C327, C430, C806		CCSQCH680J50
	C462		CCSQCH681J50
	C448, C449		CCSQCH750J50
	C312		CCSQCH820J50
	C463		CCSQCH910J50
	C450		CEAL101M6R3
	C410, C412, C422, C424, C431		CEAL470M6R3
	C440, C442, C445, C484, C491		CEAL470M6R3
	C871		CEANP100M25
	C985		CEANP101M10
	C972		CEANP220M10
	C926		CEANP2R2M50
	C403, C838		CEANP470M10
	C986		CEANPR22M50
	C904		CEAS010M50
	C323, C902		CEAS100M50
	C16, C18, C229, C247, C337		CEAS101M10
	C816, C817, C833, C844, C893		CEAS101M10
	C927, C933		CEAS101M10
	C298, C302		CEAS101M16
	C493		CEAS102M10
	C922, C976, C987		CEAS220M25
	C391, C895		CEAS221M6R3
	C101, C108, C215, C318, C331		CEAS470M10
	C801, C803, C836, C842		CEAS470M10
	C205, C208		CEAS471M10
	C845		CEAS4R7M50
	C336, C913		CEASR47M50
	C970		CEHAQ010M50
	C967, C968		CEHAQ100M50
	C211, C218, C237, C277		CEYA221M16
	C206, C209, C226, C228, C232		CEYA470M10
	C236, C266, C268, C272, C276		CEYA470M10
	C251, C253, C291, C293		CEZA101M50
	C202, C203		CEZA471M25
	C2013, C2016		CFTXA104J50
	C255, C257, C295, C297		CFTXA122J50
	C222, C223, C241, C242		CFTXA471J50
	C262, C263, C281, C282		CFTXA471J50
	C250, C290		CFTXA562J50
	C252, C292		CFTXA681J50
	C370, C371		CFTXA683J50
	C191		CFTYA103J50
	C482, C483, C908, C910, C920		CFTYA104J50
	C923		CFTYA124J50
	C316, C333, C905		CFTYA224J50
	C479		CFTYA683J50
	C111, C375, C891, C897, C914		CKSQYB102K50
	C936, C969		CKSQYB102K50
	C110, C907		CKSQYB222K50
	C919		CKSQYB332K50
	C317, C335		CKSQYB393K50
	C314, C315, C332, C334, C888		CKSQYB472K50
	C105, C122, C156-C158		CKSQYF103Z50
	C213, C214, C394, C395		CKSQYF103Z50

Mark	No.	Description	Part No.
	C426, C427, C454, C496, C807		CKSQYF103Z50
	C834, C835, C843, C872, C876		CKSQYF103Z50
	C894, C929, C937, C961, C962		CKSQYF103Z50
	C102, C104, C109, C13-C15		CKSQYF104Z25
	C151, C155, C17, C196-C198		CKSQYF104Z25
	C2015, C2022-C2024, C210, C217		CKSQYF104Z25
	C256, C296, C319, C321, C322		CKSQYF104Z25
	C330, C392, C397, C398, C404		CKSQYF104Z25
	C406, C411, C413, C423, C425		CKSQYF104Z25
	C432, C441, C443, C446, C451		CKSQYF104Z25
	C453, C461, C481, C485, C492		CKSQYF104Z25
	C494, C495, C802, C804		CKSQYF104Z25
	C831, C832, C840, C841		CKSQYF104Z25
	C873, C874, C892, C896, C901		CKSQYF104Z25
	C915, C928, C932, C981, C988		CKSQYF104Z25
	C921		CKSQYF223Z50
	C837, C930		CKSQYF333Z25
	C103, C465, C808, C815, C847		CKSQYF473Z25
	C875, C877, C911, C912		CKSQYF473Z25
	C924, C925, C964, C971		CKSQYF473Z25
	C983, C984		CKSQYF473Z25
	C238, C278, C374		CKSQYF473Z50
	C304, C305		CKSYF105Z16
	C934		CQMA122J50
	C903, C909		CQMA222J50
	C991	(1F/5.5V)	VCH1039
	C234, C254, C274, C294	(47 μF/50V)	VCH1148
	C220, C239, C260, C279	(47 μF/25V)	VCH1149

RESISTORS

	R10, R260, R300	RD1/6PM101J
	R242-R245, R250-R253	RD1/6PM103J
	R282-R285, R290-R293	RD1/6PM103J
	R259, R299	RD1/6PM122J
	R254, R255, R294, R295	RD1/6PM153J
	R257, R297	RD1/6PM162J
	R258, R298	RD1/6PM202J
	R192, R193, R239, R289	RD1/6PM220J
	R440, R441	RD1/6PM220J
	R204, R209	RD1/6PM221J
	R261, R301	RD1/6PM223J
	R236, R237, R240, R241	RD1/6PM303J
	R276, R277, R280, R281	RD1/6PM303J
	R405	RD1/6PM331J
	R262, R263, R302, R303	RD1/6PM471J
	R492	RD1/6PM4R7J
	R256, R296	RD1/6PM751J
	R396	RD1/6PM910J
	R22	RN1/10SC750D
	R173, R174	RN1/10SE103D
	R459, R484	RN1/10SE203D
	R312, R318	RN1/10SE222D
	R171, R172, R175, R178	RN1/10SE333D
	R201, R205	RS2LMF560J
	VR606	VRTB6VS153
	VR601	VRTB6VS222
	VR450	VRTB6VS332
	VR605	VRTB6VS333
	VR101	VRTB6VS471
	VR603	VRTB6VS472

Mark	No.	Description	Part No.
	VR604, VR607, VR612		VRTB6VS473
	Other Resistors		RS1/10S□□□J

OTHERS

		4P CABLE HOLDER	51048-0400
		12P CABLE HOLDER	51048-1200
	CN106	11P TOP POST	B11P-SHF-1AA
	CN52	KR CONNECTOR	B13B-PH-K-S
	CN104	KR CONNECTOR 3P	B3B-PH-K-S
	CN125	3P TOP POST	B3P-SHF-1AA
	CN107	KR CONNECTOR	B4B-PH-K-S
	CN110	5P TOP POST	B5B-EH
	CN51	KR CONNECTOR	B5B-PH-K-S
	CN54	KR CONNECTOR	B5B-PH-K-R
	CN53	KR CONNECTOR	B6B-PH-K-S
	J11	2mm PITCH JUMPER 4P	D20PDD0425E
	JA8	OPTICAL OUTPUT MODULE	GP1F32T
	JA3, JA4	REMORE CONTROL JACK	RKN1004
	CN105	2mm PITCH JUMPER 6P	SBRK06S-4
	CN103	24P CONNECTOR	SLEM24S-2
		PCB BINDER	VEF1040
	JA15	COAXIAL PIN JACK	VKB1052
	JA6	4P PIN JACK	VKB1071
	JA7	1P PIN JACK	VKB1072
		CONDUCTIVE PLATE B	VNE1194
		IC HEAT SINK	VNE1921
		SCREW TERMINAL	VNE1948
		EARTH PLATE	VNF-091
	X101	CERAMIC RESONATOR(9.00MHz)	VSS1040
	X201	CRYSTAL RESONATOR(16MHz)	VSS1051

SACB ASSY(CLD-79/KU/CA)

SEMICONDUCTORS

	IC102	BA10393F
	IC202, IC804, IC903	BA4560F
	IC351	CA0002AM
	IC410, IC411	ICP-N5
	IC803	LA6510
	IC802	LC78681E
	IC206	NJM78L08A
	IC207	NJM79L08A
	IC401	PA0023AD
	IC400	PA0058A
	IC801	PAC002A
	IC901	PAC003A
	IC101	PD0205D
	IC201	PD2029A
	IC902	TA8464K
	IC391	TC74HCU04AP
	Q102, Q154, Q400, Q474, Q802	2SA1037K
	Q912, Q963, Q992	2SA1037K
	Q401, Q834	2SB1237X
	Q993	2SC1740S
	Q201, Q202, Q351, Q380	2SC2412K
	Q410, Q411, Q442-Q444, Q460	2SC2412K
	Q475, Q801, Q805, Q903-Q905	2SC2412K
	Q907-Q909, Q911, Q913, Q917	2SC2412K
	Q919	2SC2412K

Mark	No.	Description	Part No.
	Q152, Q803, Q804		2SC3802K
	Q402		2SD1858X
	Q204, Q205		2SD2144S
	Q962		2SK184
	Q203, Q207-Q213, Q383, Q497		UN2112
	Q916, Q991		UN2112
	Q103, Q206, Q461		UN2212
	D202		11EQS06
	D102, D103, D205-D208, D450		1SS254
	D903, D904, D906, D907		1SS254
	D963, D964, D992, D993		1SS254
	D201		FC54M
	D991		MTZJ10B
	D994		MTZJ6. 2A
COILS			
	L202, L204		LAU010J
	L413, L805		LAU100J
	L394		LAU101J
	L391, L414		LAU120J
	L802, L803		LAU121J
	L351, L804		LAU181J
	L352, L412, L461, L806, L807		LAU220J
	L411, L470, L471		LAU270J
	L410		LAU330J
	L420, L421		LAU390J
	L430, L462		LAU560J
	L201, L203, L460		LAU680J
	L205		LAU820J
	L392		VTL1042
CAPACITORS			
	C420, C428, C434, C436, C438		CCSQCH070D50
	C475		CCSQCH070D50
	C159, C393, C809, C811		CCSQCH100D50
	C163, C258, C259, C370, C414		CCSQCH101J50
	C464		CCSQCH101J50
	C437		CCSQCH120J50
	C416, C814, C846, C848		CCSQCH121J50
	C232, C474, C477		CCSQCH150J50
	C161, C353, C810		CCSQCH151J50
	C352		CCSQCH180J50
	C220, C452		CCSQCH220J50
	C162, C417, C421, C812, C935		CCSQCH221J50
	C371, C419, C433, C931		CCSQCH270J50
	C106, C107, C354, C435, C813		CCSQCH330J50
	C351, C418, C478		CCSQCH390J50
	C112, C260-C263, C409, C415		CCSQCH470J50
	C476, C963		CCSQCH470J50
	C375, C430, C806		CCSQCH680J50
	C462		CCSQCH681J50
	C448, C449		CCSQCH750J50
	C374		CCSQCH820J50
	C463		CCSQCH910J50
	C450		CEAL101M6R3
	C410, C412, C422, C424, C431		CEAL470M6R3
	C440, C442, C445, C484, C491		CEAL470M6R3

Mark	No.	Description	Part No.
	C871		CEANP100M25
	C985		CEANP101M10
	C274, C275, C972		CEANP220M10
	C227, C281, C926		CEANP2R2M50
	C403, C838		CEANP470M10
	C986		CEANPR22M50
	C904		CEAS010M50
	C228, C367, C902		CEAS100M50
	C225, C226, C256, C364		CEAS101M10
	C816, C817, C833, C844, C893		CEAS101M10
	C927, C933		CEAS101M10
	C493		CEAS102M10
	C922, C976, C987		CEAS220M25
	C391, C895		CEAS221M6R3
	C101, C108, C230, C252, C253		CEAS470M10
	C269, C271, C363, C369, C801		CEAS470M10
	C803, C836, C842		CEAS470M10
	C255, C257		CEAS471M10
	C845		CEAS4R7M50
	C368, C913		CEASR47M50
	C970		CEHAQ010M50
	C967, C968		CEHAQ100M50
	C278, C282		CFTXA332J50
	C191		CFTYA103J50
	C482, C483, C908, C910, C920		CFTYA104J50
	C923		CFTYA124J50
	C359, C360, C905		CFTYA224J50
	C479		CFTYA683J50
	C111, C891, C897, C914, C936		CKSQYB102K50
	C969		CKSQYB102K50
	C110, C907		CKSQYB222K50
	C919		CKSQYB332K50
	C361, C362		CKSQYB392K50
	C355-C358, C888		CKSQYB472K50
	C105, C122, C156-C158, C213		CKSQYF103Z50
	C231, C234, C251, C286, C288		CKSQYF103Z50
	C394, C395, C426, C427, C454		CKSQYF103Z50
	C496, C807, C834, C835, C843		CKSQYF103Z50
	C872, C876, C894, C929, C937		CKSQYF103Z50
	C961, C962		CKSQYF103Z50
	C102, C104, C109, C151, C155		CKSQYF104Z25
	C196-C198, C212, C215, C254		CKSQYF104Z25
	C270, C272, C284, C285		CKSQYF104Z25
	C365, C366, C372, C373		CKSQYF104Z25
	C386, C387, C392, C404, C406		CKSQYF104Z25
	C411, C413, C423, C425, C432		CKSQYF104Z25
	C441, C443, C446, C451, C453		CKSQYF104Z25
	C461, C481, C485, C492		CKSQYF104Z25
	C494, C495, C802, C804		CKSQYF104Z25
	C831, C832, C840, C841		CKSQYF104Z25
	C873, C874, C892, C896, C901		CKSQYF104Z25
	C915, C928, C932, C981, C988		CKSQYF104Z25
	C921		CKSQYF223Z50
	C837, C930		CKSQYF333Z25
	C103, C214, C465, C808, C815		CKSQYF473Z25

Mark	No.	Description	Part No.
	C847, C875, C877, C911, C912		CKSQYF473Z25
	C924, C925, C964, C971		CKSQYF473Z25
	C983, C984		CKSQYF473Z25
	C376		CKSQYF473Z50
	C934		CQMA122J50
	C903, C909		CQMA222J50
	C991	(1F/5.5V)	VCH1039

RESISTORS

	R241, R242	(4.7Ω)	DCN1001
	R192, R193, R440, R441		RD1/6PM220J
	R405		RD1/6PM331J
	R492		RD1/6PM4R7J
	R396		RD1/6PM910J
	R388		RN1/10SC750D
	R173, R174		RN1/10SE103D
	R459, R484		RN1/10SE203D
	R171, R172, R175, R178		RN1/10SE333D
	R259-R262		RN1/10SE473D
	VR606		VRTB6VS153
	VR601		VRTB6VS222
	VR450		VRTB6VS332
	VR605		VRTB6VS333
	VR101		VRTB6VS471
	VR603		VRTB6VS472
	VR604, VR607, VR612		VRTB6VS473
	Other Resistors		RS1/10S□□□J

OTHERS

		4P CABLE HOLDER	51048-0400
		12P CABLE HOLDER	51048-1200
	CN106	11P TOP POST	B11P-SHF-1AA
	CN52	KR CONNECTOR	B13B-PH-K-S
	CN104	KR CONNECTOR 3P	B3B-PH-K-S
	CN125	3P TOP POST	B3P-SHF-1AA
	CN107	KR CONNECTOR	B4B-PH-K-S
	CN110	5P TOP POST	B5B-EH-S
	CN51	KR CONNECTOR	B5B-PH-K-S
	CN54	KR CONNECTOR	B5B-PH-K-R
	CN53	KR CONNECTOR	B6B-PH-K-S
	J11	2mm PITCH JUMPER 4P	D20PDD0425E
	JA8	OPTICAL OUTPUT MODULE	GP1F32T
	JA3, JA4	REMOTE CONTROL JACK	RKN1004
	CN105	2mm PITCH JUMPER 6P	SBRK06S-4
	CN103	24P CONNECTOR	SLEM24S-2
		PCB BINDER	VEF1040
	JA15	COAXIAL PIN JACK	VKB1052
	JA6	4P PIN JACK	VKB1071
	JA7	1P PIN JACK	VKB1072
		IC HEAT SINK	VNE1921
		SCREW TERMINAL	VNE1948
		EARTH PLATE	VNF-091
	X101	CERAMIC RESONATOR(9.00MHz)	VSS1040
	X201	CRYSTAL RESONATOR(16MHz)	VSS1057

Mark	No.	Description	Part No.

DVDB ASSY(CLD-99/KU/CA)

SEMICONDUCTORS

	IC604	CXD1171M
	IC602	CXK48324Q
	IC500	PD0146A
	IC650	PD0154A
	IC601	PD3212A
	IC605, IC705	TC74HC4053AF
	Q580, Q681, Q780, Q793	2SA1037K
	Q781, Q782, Q786, Q794, Q795	2SC1740S
	Q680, Q714, Q796	2SC2412K
	Q690	UN2212

COILS AND FILTER

	L710-L713	LFA220J
	L571, L680, L681	LFA270K
	F580	VTF1054
	L601-L604	VTH1024

CAPACITORS

	C562	CCSQCH050C50
	C747, C761	CCSQCH060D50
	C693	CCSQCH070D50
	C552	CCSQCH100D50
	C798	CCSQCH101J50
	C692, C695	CCSQCH150J50
	C540, C542, C554, C579, C640	CCSQCH220J50
	C746, C749, C760, C763	CCSQCH220J50
	C544, C591	CCSQCH221J50
	C696	CCSQCH270J50
	C563	CCSQCH330J50
	C694	CCSQCH390J50
	C543, C580, C750, C764	CCSQCH470J50
	C748, C762	CCSQCH560J50
	C553, C561	CCSQCH680J50
	C799	CEANP2R2M50
	C534, C535, C9632	CEAS101M10
	C550, C585	CEAS221M10
	C530, C538, C588, C601, C603	CEAS470M10
	C605, C607, C609, C611, C613	CEAS470M10
	C621, C670, C681, C683, C780	CEAS470M10
	C782, C785, C786	CEAS470M10
	C699	CKSQYB222K50
	C570-C573, C577, C578, C581	CKSQYF103Z50
	C698	CKSQYF103Z50
	C531-C533, C539, C541, C551	CKSQYF104Z25
	C575, C582, C589, C592, C593	CKSQYF104Z25
	C602, C604, C606, C608, C610	CKSQYF104Z25
	C612, C614, C616, C620, C671	CKSQYF104Z25
	C680, C682, C684-C687, C689	CKSQYF104Z25
	C691, C708, C759, C766, C768	CKSQYF104Z25
	C781, C783, C789, C794, C795	CKSQYF104Z25
	C9611, C9615	CKSQYF104Z25
	VC901 (20pF)	VCM-080

RESISTORS

	VR651, VR652, VR705	VRTB6VS102
	VR653, VR704	VRTB6VS222
	Other Resistors	RS1/10S□□□J

Mark	No.	Description	Part No.
OTHERS			
		3P CABLE HOLDER	51048-0300
	CN52	KR CONNECTOR	B13B-PH-K-S
	CN51	KR CONNECTOR	B5B-PH-K-S
	CN54	KR CONNECTOR	B5B-PH-K-R
	CN53	KR CONNECTOR	B6B-PH-K-S
		PCB BINDER	VEF1040
	JA1	2P PIN JACK	VKB1061
		4P MINI DIN SOCKET	VKN1078
		SCREW TERMINAL	VNE1948
		SHIELD CASE A	VNE1956
		SHIELD CASE B	VNE1957
		SHIELD CASE C	VNE1958
	X550	CRYSTAL RESONATOR(14.31MHz)	VSS1026

DVDB ASSY(CLD-79/KU/CA)

SEMICONDUCTORS

IC604		CXD1171M
IC701		CXD2023Q
IC602		CXK48324Q
IC500		PD0146A
IC650		PD0154A
IC601		PD3212A
IC605, IC705		TC74HC4053AF
Q580, Q681, Q780, Q793		2SA1037K
Q781, Q782, Q786, Q794, Q795		2SC1740S
Q680, Q710, Q711, Q714, Q796		2SC2412K
Q690		UN2212

COILS AND FILTER

L710-L713		LFA220J
L571, L680, L681		LFA270K
F580		VTF1054

CAPACITORS

C562		CCSQCH050C50
C747, C761		CCSQCH060D50
C693		CCSQCH070D50
C552		CCSQCH100D50
C798		CCSQCH101J50
C692, C695		CCSQCH150J50
C542, C554, C579, C640, C746		CCSQCH220J50
C749, C760, C763		CCSQCH220J50
C544, C591		CCSQCH221J50
C696		CCSQCH270J50
C563		CCSQCH330J50
C694		CCSQCH390J50
C540		CCSQCH430J50
C543, C580, C750, C764		CCSQCH470J50
C748, C762		CCSQCH560J50
C553, C561		CCSQCH680J50
C799		CEANP2R2M50
C534, C535, C9632		CEAS101M10
C550, C585		CEAS221M10
C530, C538, C588, C601, C603		CEAS470M10
C605, C607, C609, C611, C613		CEAS470M10
C621, C670, C681, C683, C703		CEAS470M10
C720, C730, C735, C780, C782		CEAS470M10
C785, C786		CEAS470M10
C701		CKSQYB102K50
C699		CKSQYB222K50
C570-C573, C577, C578, C581		CKSQYF103Z50
C698, C704, C707		CKSQYF103Z50
C531-C533, C539, C541, C551		CKSQYF104Z25
C575, C582, C589, C592, C593		CKSQYF104Z25
C602, C604, C606, C608, C610		CKSQYF104Z25
C612, C614, C616, C620, C671		CKSQYF104Z25
C680, C682, C684-C687, C689		CKSQYF104Z25
C691, C702, C708, C712		CKSQYF104Z25
C714-C716, C719, C723, C725		CKSQYF104Z25
C734, C736, C737, C740, C742		CKSQYF104Z25
C759, C766, C768, C781, C783		CKSQYF104Z25
C789, C794, C795, C9611, C9615		CKSQYF104Z25
VC901	(20pF)	VCM-008

RESISTORS

VR651, VR652, VR705		VRTB6VS102
VR653, VR704		VRTB6VS222
VR702, VR703		VRTB6VS472
Other Resistors		RS1/10S□□□J

OTHERS

		3P CABLE HOLDER	51048-0300
	CN52	KR CONNECTOR	B13B-PH-K-S
	CN51	KR CONNECTOR	B5B-PH-K-S
	CN54	KR CONNECTOR	B5B-PH-K-R
	CN53	KR CONNECTOR	B6B-PH-K-S
		PCB BINDER	VEF1040
	JA1	2P PIN JACK	VKB1061
		4P MINI DIN SOCKET	VKN1078
		SCREW TERMINAL	VNE1948
		SHIELD CASE A	VNE1956
		SHIELD CASE B	VNE1957
		SHIELD CASE C	VNE1958
	X550	CRYSTAL RESONATOR(14.31MHz)	VSS1026

TDYC ASSY(CLD-99/KU/CA ONLY)

SEMICONDUCTORS

IC155, IC156		CXD1171M
IC153, IC154	(UPD42280GU-30)	GGC1067
IC151	(UPD6480GF-3BA)	GGC1019
IC152	(UPD6481GC-3B6)	GGC1064
Q150, Q151		2SC2412K

COILS

L151-L162	LFA101J

CAPACITORS

C151, C152, C154, C155, C158	CEAL101M6R3
C160, C161, C163, C164	CEAL101M6R3
C166-C168, C170, C171	CEAL101M6R3
C173, C174, C176, C177, C181	CEAL101M6R3
C183, C189, C191	CEAL101M6R3

Mark	No.	Description	Part No.
	C179, C180		CKSQYF103Z50
	C153, C156, C157, C159, C162		CKSQYF104Z25
	C165, C169, C172, C175, C178		CKSQYF104Z25
	C182, C184-C188, C190		CKSQYF104Z25
	C192-C196		CKSQYF104Z25
RESISTORS			
	VR101, VR102	(1kΩ)	RCP1044
	Other Resistors		RS1/10S□□□J
OTHERS			
	SCREW TERMINAL		VNE1841
	SHIELD CASE D		VNE1959
	SHIELD CASE E		VNE1960

FLKB ASSY

OTHERS			
	PC board FLKB		VNP1486

FLKY ASSY

FLKY assy of CLD-79/KU/CA is the same as that of CLD-99/KU/CA.

SEMICONDUCTORS			
	IC101		PD3295B
	IC102		S-806D
	Q102		DTA144ES
	Q101		DTC114ES
	Q104-Q106		DTC124ES
	D101-D104		1SS252
	D108-D110		1SS254
	D105		SEL2415ETP6
	D106		SEL2915AYTP6
	D107		SLR-342MC3F
COIL			
	L101		LAU220J
SWITCHES			
	S101-S103, S106-S108		RSG1030
	S104, S105		RSG1034
CAPACITORS			
	C106		CEAL100M16
	C101		CEAL101M6R3
	C102, C105		CKPUYF223Z25
	C104		CKPUYX472M16
RESISTORS			
	R102		RA4T103J
	R101		RA5T104J
	R116, R117		RD1/2VM5R6J
	Other Resistors		RD1/6PM□□□J
OTHERS			
		6P CABLE HOLDER	51048-0600
	J101	2mm PITCH JUMPER 6P	D20PDD0620E
	V101	FL TUBE	VAW1037
		FL HOLDER	VNK2854
	X101	CERAMIC RESONATOR(8MHz)	VSS1031

Mark	No.	Description	Part No.
PONS ASSY			
SEMICONDUCTORS			
	Q201, Q202		DTC124ES
	D201		SLH34VCF04
COIL			
	L201		LAU220J
SWITCH			
	S201		RSG1030
CAPACITORS			
	C201		CEJA221M6R3
	C202		CKPUYF223Z25
RESISTORS			
	All Resistors		RD1/6PM□□□J
OTHERS			
	6P CABLE HOLDER		51048-0600
	REMOTE SENSOR		GP1U58X

MACB ASSY

OTHERS			
	PC board MACB		VNP1429

CNNB ASSY

RESISTORS			
	All Resistors		RD1/6PM□□□J
OTHERS			
	CN205	KR CONNECTOR 3P	B3B-PH-K-S
	CN203	24P CONNECTOR	SLEM24S-2
	CN204	25P FFC CONNECTOR(SIDE)	SLEM25R-2

LOMB ASSY

OTHERS			
	4P CABLE HOLDER		51048-0400

LOSB ASSY

SWITCHES			
	S1-S3		DSG1015

FG ASSY

OTHERS			
	D1	PHOTO DIODE	GP1S51V
	J64	HOUSING ASSY(3P)	VKP2024

5. SELF-DIAGNOSTIC FUNCTIONS

5.1 SELF-DIAGNOSTIC FUNCTIONS

The self-diagnostic functions automatically display an error code on the TV screen and front panel fluorescent display section when there is an error. The customer checks the error code and conveys it to the service personnel to make repairs more efficient.

After an error occurs, even if the error code goes off, you can display the error code again by holding down the CLEAR key for 10 seconds (except a loading error L * display). At that time, partial error is displayed with the mechanism switch information. However, if the power cord is unplugged, the error code information is lost.

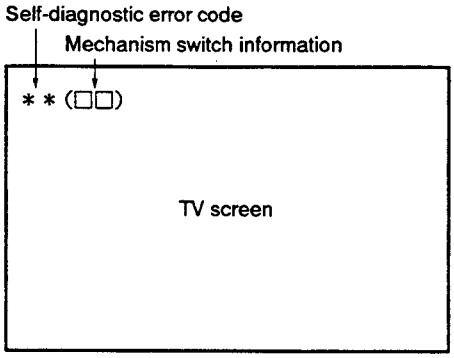


Fig. 1 TV screen display

This table explains the information for analyzing the cause when an error occurs with the CLD player.

Self-diagnostic error code	Contents	Conditions	Probable cause
H0	Spindle overcurrent detection error.	In the play state, overcurrent was detected in the spindle motor. Monitoring starts 5 seconds after the start of play or special playback mode, this error is detected if the overcurrent port is "L" for 4 seconds.	• Motor NG • Clamper rubbing
U0	FG abnormality error	① At LD start-up, the rate of rotation calculated from the FG was less than 15 rpm for 5 consecutive seconds from the spindle run command. ② At CD start-up, there was less than 1/8th rotation even after 5 seconds had passed since the end of acceleration. ③ During play search, CD : subcodes are being read/LD : Phillips codes are being read and the spindle is locked, but a state in which the rate of rotation calculated from the FG was less than 15 rpm continued for 5 seconds or more. In the above case, it is judged that an abnormality has occurred in the FG sensor and that accurate rotation rate calculation has become impossible.	• FG sensor abnormality, FG signal not coming to mechanism controller • FG sensor clogged • Rubbing between FG sensor and slit • Turntable dropped • FG slit deposition NG
H1	Partial short error	① At LD start-up, the speed did not reach 1200 rpm within a certain time (12 seconds) after the spindle run command. ② At CD start-up, a certain speed (313 rpm) was not reached within 6 seconds from the end of spindle acceleration.	• Spindle motor NG • Commutator NG • Bearing too tight • Power supply NG
H2	Power supply abnormality error	– 5V power supply abnormality detected. The power supply abnormality port is constantly monitored and if its signal stays high for about 1 second consecutively, the power supply is judged to be abnormal.	• – 5V not fed from SYPS assy • Parts shorted
A *	R plate error	When abnormality condition is detected for 80 ms consecutively between the slider switch and the turn switch for 4 seconds after the power on.	
L *	Loading error	① When loading operation goes over time (approx. 10 sec.). ② When assist at disc sense entry ends and is not tilt neutral. ③ When assist at set up entry ends and is not tilt neutral.	• Tilt switch 1, 2, 3 abnormal, so tilt/loading state not read in correctly • Tilt/loading mechanism mechanically locked • Drive IC NG • Power supply NG
E *	Slider error	During slider movement, a time over-run occurred (track count search 20 seconds, mandatory movement 10 seconds)	• Slider ceased being able to run • The slider mechanism is mechanically locked and can no longer move to its target. • Slider position switch NG • Flexible cable pulled out • Drive IC NG • Power supply abnormal

Self-diagnostic error code	Contents	Conditions	Probable cause
U1	Miss clamp error	①During LD setup, after 1/8th rotation, the track count during 1/8 rotation exceeded 511. ②During start-up, the focus was lost once and refocusing was attempted, but the focus could not be locked. ③When spindle is not stopped within 2 seconds before CDV changes A to V (or V to A), clamp error is set by judging the double disc. ④The FG pulse did not come for three times or more within 800 ms from the start of LD start-up. ⑤When the disc clamp operation did not end within 5 seconds.	•Disc sandwiched •Disc shifted •Spindle motor NG •Disc scratched or dirty defocused during start-up •Two discs loaded •PU actuator NG •Tilt sensor NG •Tilt neutral NG (tilt base NG)
P *	Spindle error	①During TOC reading with an LD, the spindle servo was not locked within 60 seconds from the start of the spindle run. ②When CAV/CLV determination is not finished within 60 seconds from spindle servo lock. ③The codes could not be read for 10 – 15 seconds consecutively for an LD or 7 – 10 seconds for a CD/CDV and the spindle servo was not locked. ④The speed exceeded 2100 rpm during LD start-up.	P0:•PH code, SUB-Q code can not be read •VCO, PLL offset out of adjustment •Disc defect P5:•PAL disc, mirror disc, etc. PLAY •No RF P6:•Spindle servo does not lock •Spindle motor NG
F *	Focus error	①In the "no disc" state, a setup command was received from the mode controller. ②When LD is out of focus when slider is moved to starting position during set up. In case of CD/CDV is NG even after three focus tries. ③During start-up, the maximum slider servo duty continued for 3 loops or more.	F5:•CD, LD on top of each other •LD scratched or dirty defocused during slider movement •Disc NG •Slider position switch NG F6:•Inner edge of disc scratched or dirty •Slider ran into inner edge mechanical stopper

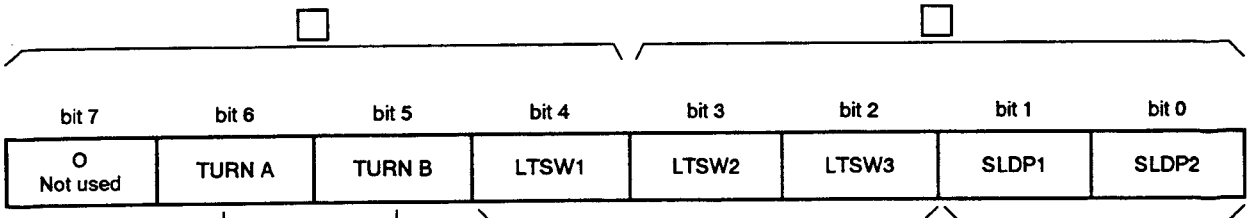
* Besides the above errors, there is the "U2" communications error (the mode controller could not communicate normally with the mechanism controller) The probable cause is a defective mechanism controller, disconnected cable, etc..
* After an error occurs, even if the error code goes off, you can display the error code again by holding down the CLEAR key for 10 seconds. At that time, partial error is displayed with the mechanism switch information.
Mechanism mode contents (meanig of * for L * etc.)

0 : Play	4 : Disc sense	8 : Search
1 : Open	5 : Setup (rotation start)	9 : Side A → Side B
2 : Standby	6 : TOC read	A : Side B → Side A
3 : Clamp	7 : Play	

5.2 FORMAT OF THE MECHANISM SWITCH INFORMATION WHICH IS TRANSMITTED TO THE MODE CONTROL IN THE ERROR OCCURRENCE

• Mechanism switch information (□□)

Mechanism control → Mode control
Communication byte address 6 (COMBUF5)
(Mode control displays this value as it is.)



TURN A	Slider position
0	Side A
1	Other

TURN B	Slider position
0	Side B
1	Other

LTSW 1	2	3	Loading/tilt position
0	1	1	Open (Tray open state)
0	0	1	Loading (During move the tray horizontally)
1	0	1	Standby (Tray close & spindle down state)
1	0	0	Clamp (Durring spindle up or down)
0	0	0	Tilt – (Clamp state)
0	1	0	Tilt + (Clamp state)
1	1	0	Tilt limit (Clamp state)

SLDP 1	2	Slider position
0	0	CD active position
0	1	CDV active position
1	0	LD active position
1	1	CD inside position and Side B inside position

6. ADJUSTMENTS

6.1 TEST MODE

1) How to start the test mode

On the SACB assy, Short circuit the test mode JP and GND JP, the test mode is started by pressing the power switch ON. (Fig. 1)

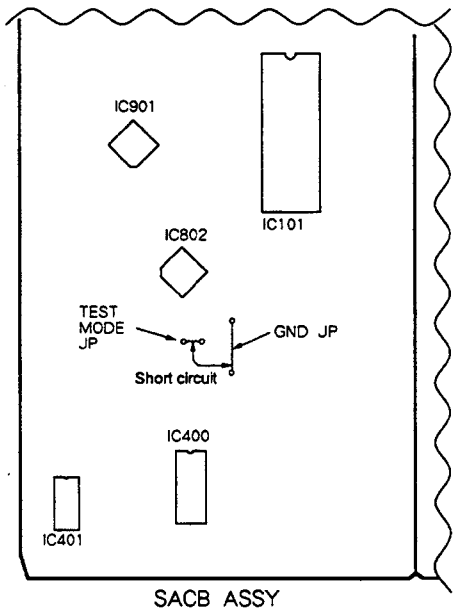
After confirming that all FL indicators are lit, remove test mode JP and GND JP connection. If you have test mode remote control unit (GGF1067), press [ESC] key and [TEST] key in order with power switch ON.

2) How to cancel the test mode

Turn power switch OFF. Or, press test mode remote control [ESC] key.

3) Functions and key control when in test mode

Note : For keys not on player or on accompanying remote control, use test mode remote control unit (GGF1067).



SACB ASSY

Fig. 1

• Key Operation in the Test Mode

Player Status	Key Operation	Function	TV Screen Display
Tray Open	⏮/⏭ SKIP (Refer to Note 1)	⏮ : Shifts the tray in the closed direction and also raises the turn table while pressing the key. ⏭ : Shifts the tray in the open direction and also lowers the turn table while pressing the key.	
Tray Open	▶ PLAY	Clamps	
Clamp	▶ PLAY	Turns the disc through TRK Servo OFF	TRK-OFF
TRK Servo OFF	▶ PLAY	TRK Servo ON	TRK-ON
TRK Servo ON	▶ PLAY	TRK Servo OFF	TRK-OFF
TRK Servo ON	◀❚❚ / ❚❚▶ (STEP)	FOCS balance select	F-0/F-1
TILT Neutral	+ MULTI-SPEED	TILT Servo ON	T-□:ON
TILT ON	- MULTI-SPEED	TILT Neutral	T-□:N
TILT Neutral or ON	⏮/⏭ SKIP	Setting TILT Servo to OFF, can force TILT to move.	T-1 to T-E
Clamp	◀◀/▶▶ SCAN	Can force the slider to move	S-LD S-CDV S-CD S-IN
Play	❚❚ PAUSE	Still	
Play	■ STOP	Stop	
Stop	▲ OPEN	Open	
Play	[+10] ⇩ [0] to [9] ⇩ [▶ PLAY]	Set to SEARCH lead address input mode. Designates the SEARCH lead address through keys 0 to 9. Press the CLEAR [C] key if the designated address is incorrect. Searches the designated address upon pressing the PLAY key.	

Note 1 : Press SKIP (⏮/⏭) keys after the tray is set to open state by pressing OPEN (▲) key. Because, in tray open state, pressing PLAY (▶) key causes is to set to clamp state and SKIP (⏮/⏭) keys can not function properly.

Table 1

• Player Operation in the Test Mode (Disc tray is removed)

Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

• CD PLAYBACK

① Place the CD disc on the turn table.

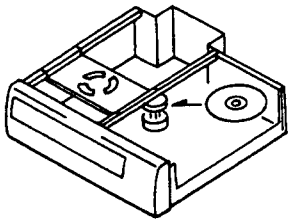


Fig. 2

② Press the PLAY (▶) key once.
(Twin gear starts to move.)

③ Push the cam plate (Fig.3) in the direction of the arrow and wait until the CD disc is clamped.

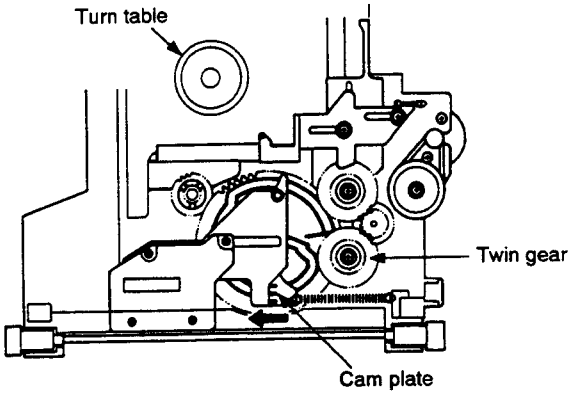
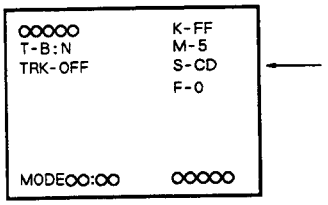


Fig. 3

④ Press the ◀◀ or ▶▶ keys to appear "S - CD" on the TV screen display.



TV screen display

Fig. 4

⑤ After pressing the PLAY (▶) key once to clamp the disc, press the PLAY (▶) key twice, disc will be normally playbacked.

• LD PLAYBACK

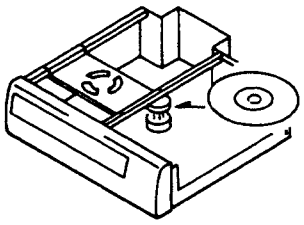


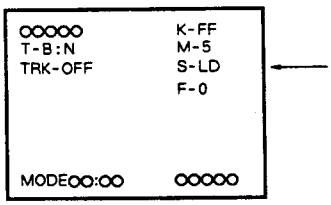
Fig. 5

① Press the PLAY (▶) key once.
(Twin gear starts to move.)

② Press the SKIP REV (|◀◀) key to raise the turn table (spindle motor section) while pressing the cam plate (Fig. 3) in the direction of the arrow.
Raise it to the position where the LD disc can be easily placed on the turn table.
If the turn table is raised too high, lower it with the SKIP FWD (▶▶|) key.

③ Place the LD disc on the turn table and press the PLAY (▶) key once to clamp the disc.

④ Press the ◀◀ or ▶▶ keys to appear "S - LD" on the TV screen display.



TV screen display

Fig. 6

⑤ After pressing the PLAY (▶) key once to clamp the disc, press the PLAY (▶) key twice, disc will be normally playbacked.

6.2 ADJUSTMENT PRECAUTIONS

• Equipment and Jigs Needed for Adjustment

- CD test disc (STD - 901 or STD - 902)
- LD test disc (GGV1003)
- (–) Phillips screwdriver (Large)
- (–) Phillips screwdriver (Medium)
- (–) Phillips screwdriver (Small)
- (+) screwdriver (Large)
- (+) screwdriver (Medium)
- Hexagonal wrench (straight type, size : 3mm)
- Resistor (10kΩ × 2, 47kΩ × 1)
- Two-channel oscilloscope (with delay)
- AF oscillator
- Frequency counter
- Digital voltmeter
- TV monitor
- Low-pass filter

• Preparation for Adjustment

1. Remove the seven screws Ⓐ that stabilize the bonnet and take off the bonnet. (Fig. 7)
2. Remove the two tray stopper screws Ⓑ and press the OPEN/CLOSE button to put the tray unit in the open position. (Fig. 7)
3. While pushing the hook Ⓒ on the right rear of the disc tray to the left, pull out the tray unit. (Fig. 7)

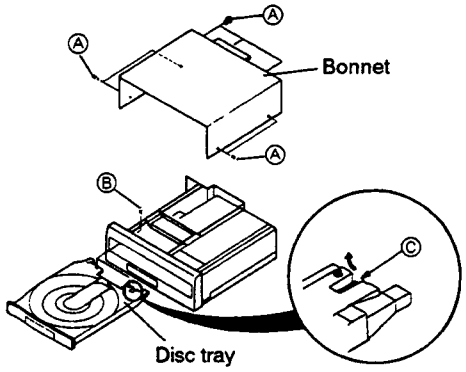


Fig. 7

4. Remove the six screws Ⓓ stabilize the DVDB assy. (Fig. 8)
5. Remove the four screws Ⓔ on the rear panel. (Fig. 8)

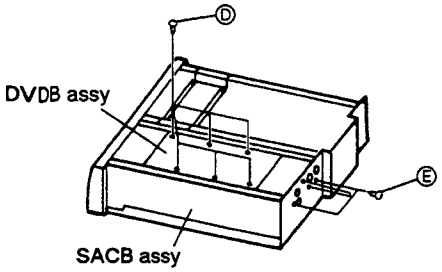


Fig. 8

6. Set the DVDB and TDYC assemblies to the open state. (Fig. 9)

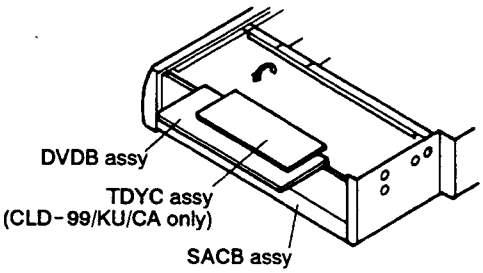


Fig. 9

- As shown in Fig. 10, fit the SACB assy between PCB spacer and PCB support on the chassis and standing it against the inside of the chassis, the back of the PCB (pattern side) can be diagnosed.

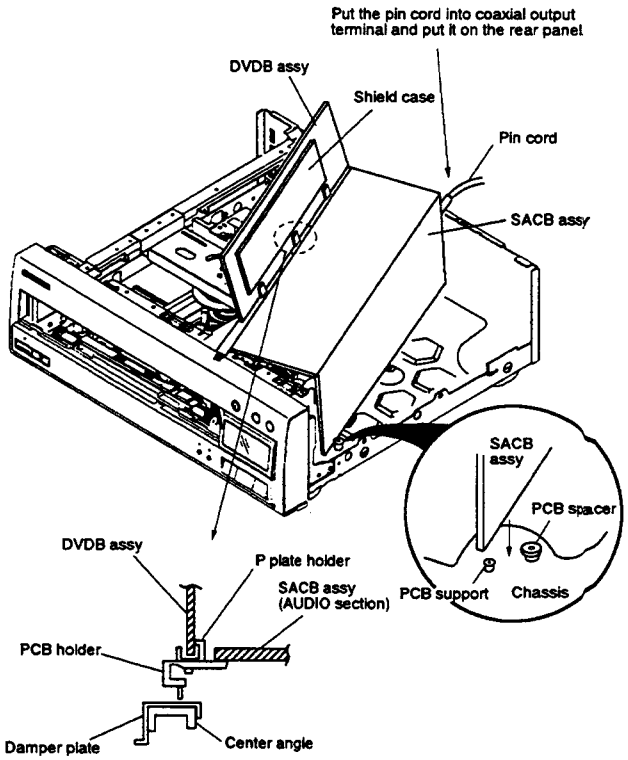


Fig. 10

• Before Adjusting Mechanism System

Note: Be careful not to turn centering adjustment screw and TAN adjustment screw past their adjustment range.

- Adjustment Range of Centering Adjustment Screw -

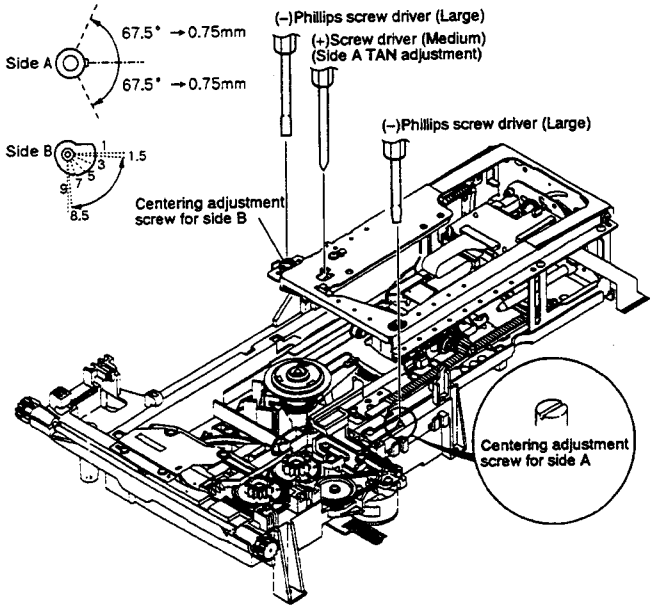


Fig. 11 Mechanism assy adjustment

- Adjustment Range of TAN Adjustment Screw -

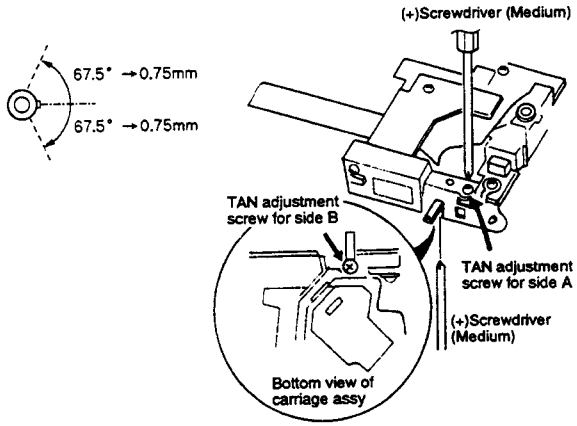


Fig. 12 Carriage assy adjustment

• Notes When Adjusting Centering

For both side A and B, if the amplitude of the error waveform of the disc's innermost and outermost tracks at TRK - OFF are about the same, then course adjustment is not necessary.

If waveform S/N is bad and difficult to observe in "2. Coarse centering adjustment for side A " and "6. Fine centering adjustment for side A " use the low-pass filter in diagram. (Fig. 13)

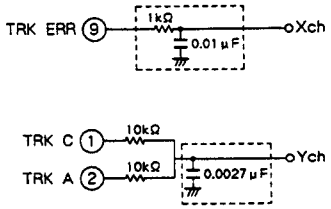


Fig. 13 Low-pass filter

• RACK Assy Position When Adjusting Centering

When moving slider to inner position to adjust the innermost track of disc during centering adjustment, be careful not to keep the mechanism stopper and RACK assy from bumping each other. (Fig. 14)

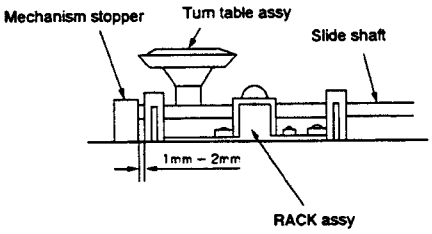


Fig. 14 Rack assy position when adjusting centering

• Notes When Adjusting Pickup Assy

Please clean lens first when readjusting the PICKUP assy that is on this product. Also, when changing PICKUP assy, change whole CARRIAGE assy (VWT1100).

6.3 ADJUSTMENT LOCATIONS

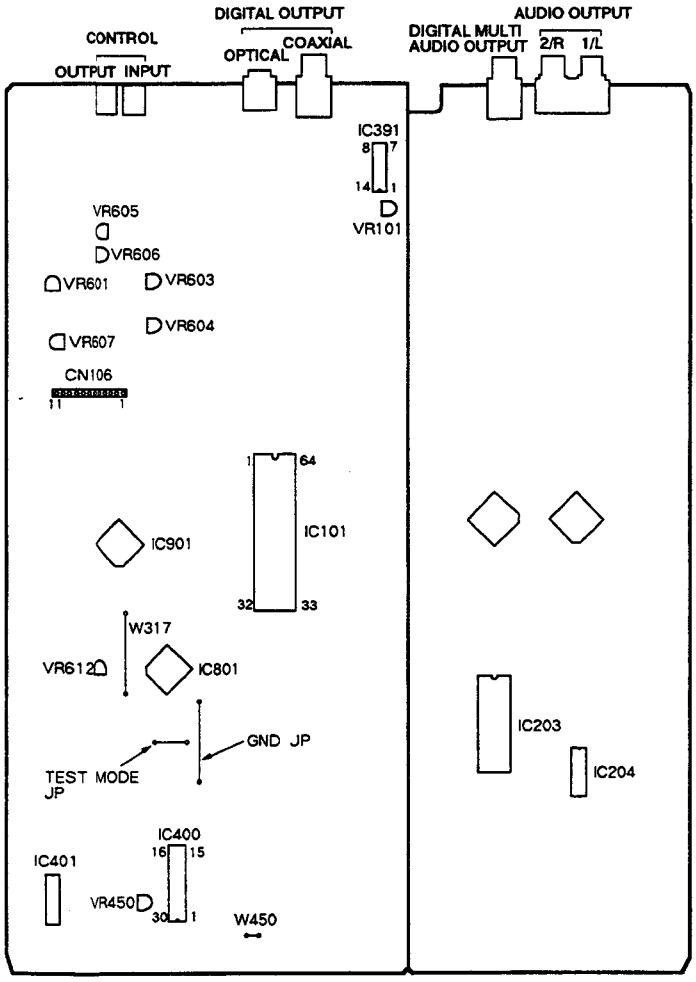


Fig. 15 Adjustment diagram of SACB assy

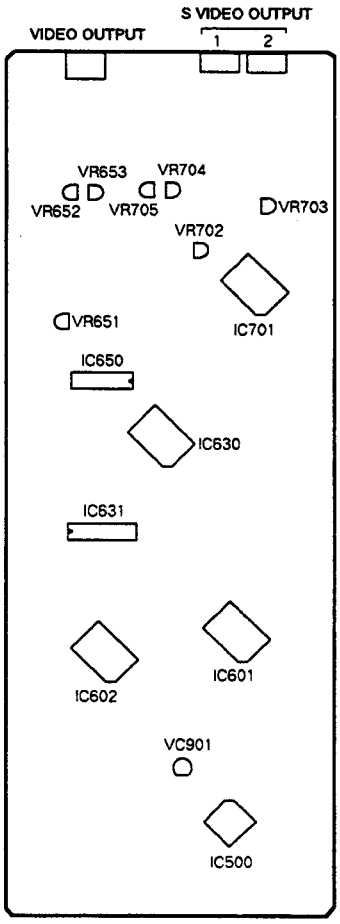


Fig. 16 Adjustment diagram of DVDB assy

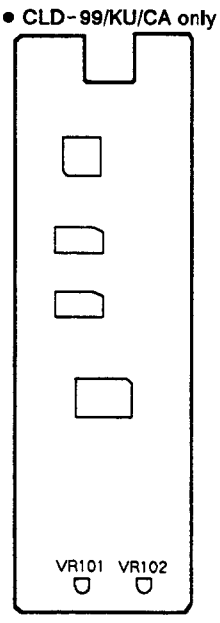
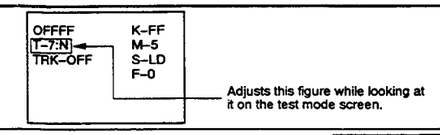
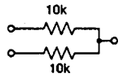
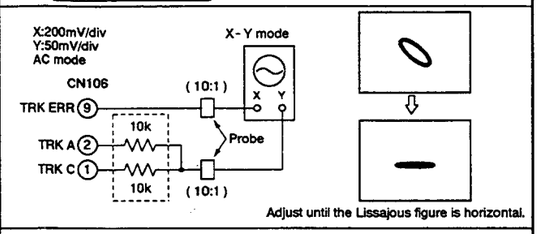
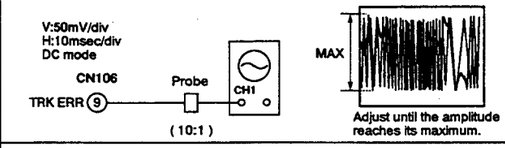
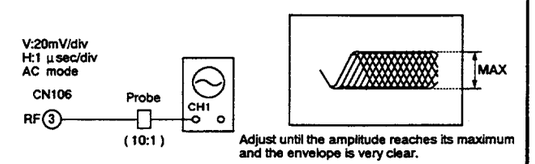
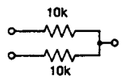
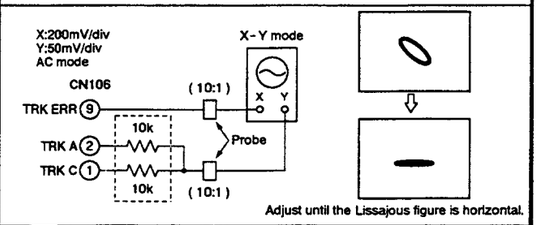
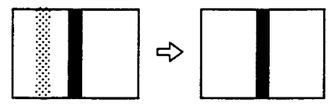
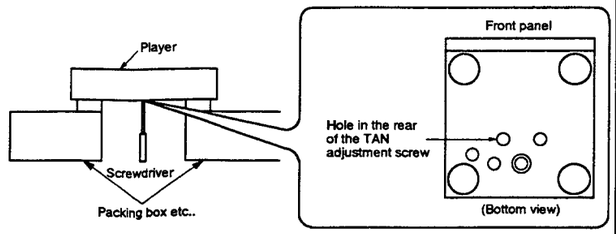


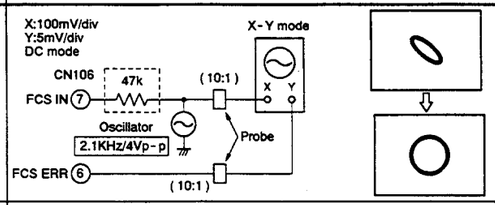
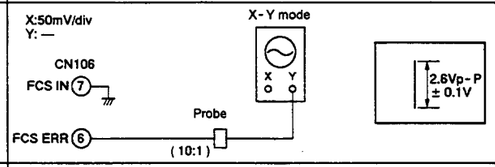
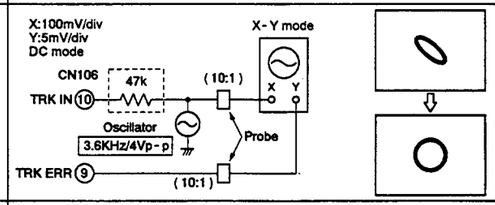
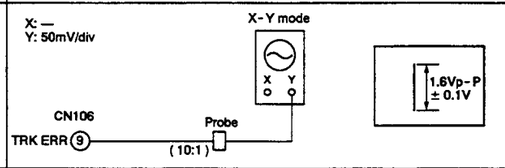
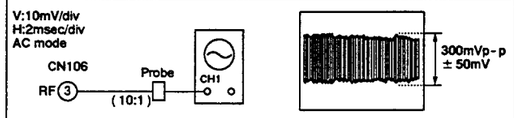
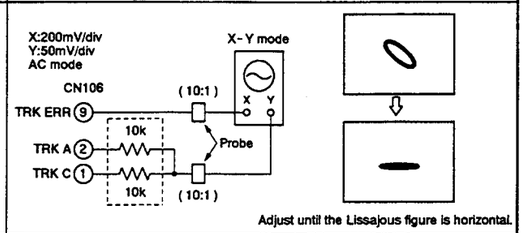
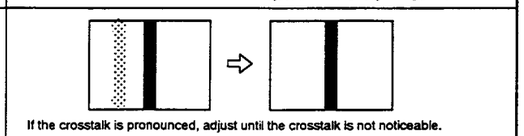
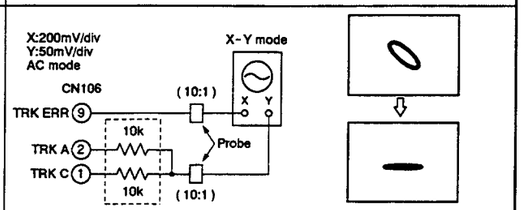
Fig. 17 Adjustment diagram of TDYC assy

6.4 ADJUSTMENT METHOD

1) MECHANICAL ADJUSTMENT

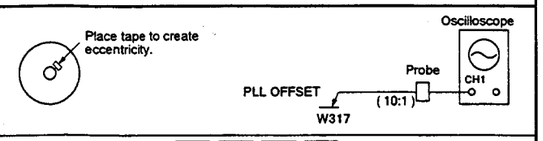
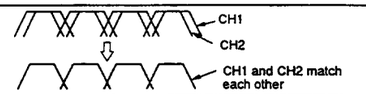
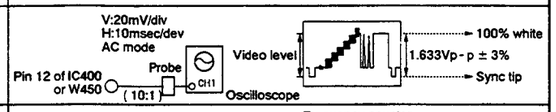
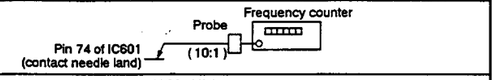
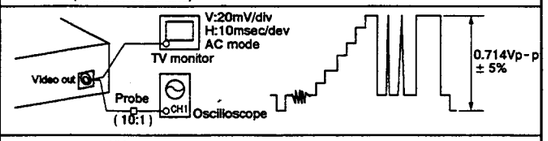
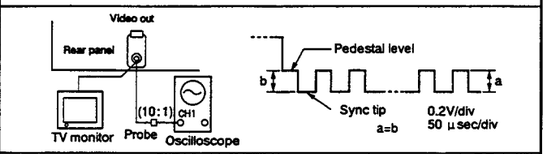
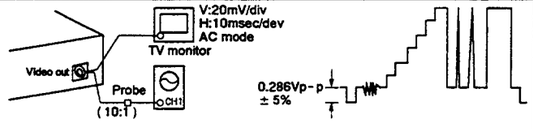
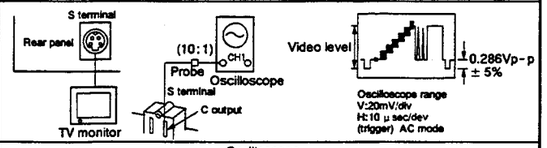
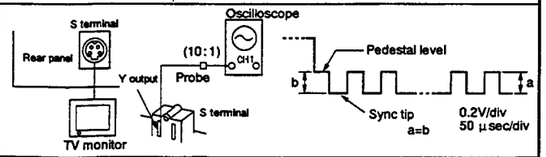
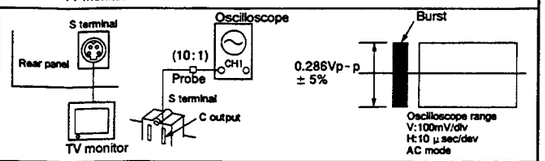
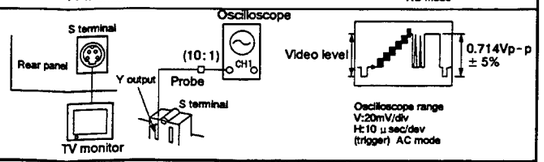
Note : All VRs and CNs (connectors) in the tables are parts of SACB assy.

Step	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Tilt offset check and adjustment	VR607	• TV monitor	Tilt indication on test mode screen	• Power ON • Test mode • Disc not installed	1. Check if the tilt indication on the test mode screen is at T–6 to T–8. 2. If the tilt indication is not at T–6 to T–8, adjust VR607 until the tilt indication reaches T–6 to T–8.	
2	Coarse centering adjustment for side A	Mechanism assy Centering adjustment screw for side A	• ⊖ Screwdriver(Large) • Oscilloscope • CD test disc • MIX resistor 	CN106 X : pin 9 (TRK ERR) Y : pin 1+2 (TRK SUM)	• Test mode TRK servo OFF, Tilt servo ON • Innermost track of CD test disc which does not come in contact with the mechanical stopper.	Note : Be careful not to turn the centering adjustment screw past its limit. 1. Move the slider until it does not come in contact with the mechanical stopper at the slider position indication S–IN. 2. Observe TRK ERR (X ch) and TRK SUM (Y ch) at the X–Y mode during TRK servo OFF. 3. Adjust centering adjustment screw for side A until the Lissajous figure is horizontal.	
3	FCS balance adjustment (1) TRK ERR MAX	VR605	• Oscilloscope • CD test disc	CN106 pin 9 (TRK ERR)	• Test mode TRK servo OFF, Tilt servo ON • Inner track of CD test disc	1. Observe TRK ERR at CH 1 of the oscilloscope during TRK servo OFF. 2. Adjust VR605 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	
4	FCS balance adjustment (2) RF level MAX	VR606	• Oscilloscope • CD test disc	CN106 pin 3 (RF)	• Test mode TRK servo ON, Tilt servo ON • Inner track of CD test disc	1. Observe RF at CH 1 of the oscilloscope during TRK servo ON. 2. Adjust VR606 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	
5	Tangential direction angle adjustment for side A	Carriage assy TAN adjustment screw for side A	• Oscilloscope • CD test disc • ⊕ Screwdriver (Medium)	CN106 pin 3 (RF)	• Test mode TRK servo ON, Tilt servo ON • Outermost track of CD test disc (position where TAN adjustment screw can be seen)	Note : Be careful not to turn the centering adjustment screw past its limit. 1. Observe RF at CH 1 of the oscilloscope during TRK servo ON. 2. Turn TAN adjustment screw for side A until the amplitude of the waveform reaches its maximum and the envelope is clear. After adjustment, stabilize the screw with an adhesive.	
6	Fine centering adjustment for side A	Mechanism assy centering adjustment screw for side A	• Oscilloscope • CD test disc • MIX resistor 	CN106 X : pin 9 (TRK ERR) Y : pin 1+2 (TRK SUM)	• Test mode TRK servo OFF, Tilt servo ON • Innermost track of CD test disc which does not come in contact with the mechanical stopper.	Note : Be careful not to turn the centering adjustment screw past its limit. Perform fine centering adjustment again by following the same procedure as in step 2. After adjustment, stabilize the screw with an adhesive.	
7	Crosstalk and tilt offset adjustment	VR607	• TV monitor • LD test disc	Crosstalk check screen	• Test mode TRK servo ON ,Tilt servo ON • LD test disc #115 STILL	1. Search for address #115 of LD test disc and still the address. 2. Check the crosstalk. If the crosstalk is pronounced, adjust VR607 until the crosstalk is not noticeable.	
	When the crosstalk is still noticeable in spite of the adjustment in step 7, after carrying out the adjustment in step 1 and bringing the tilt indication to T–6 to T–8, use a hexagonal wrench (straight type, size : 3mm) to adjust the TAN adjustment screw on the bottom side of the player through the LD test disc #115 STILL screen. Afterwards, perform the adjustment procedure from step 6.						

Step	Adjustment name	Adjustment point		Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
8	FCS servo loop gain adjustment (Perform with either method A or B)	A	VR604	• Oscilloscope • LD test disc • AF oscillator • Resistor(47kΩ)	CN106 X: pin 7 (FCS IN) Y: pin 6 (FCS ERR)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #15,000 STILL	1. Xch : Connect to pin 7 with 47k Ω . Ych : Connect to pin 6. 2. Search #15,000 of LD test disc and still the address. 3. Connect AF oscillator between X ch and 47k Ω and adjust VR604 until Lissajous figure is circle.	
		B	VR604	• Oscilloscope • LD test disc • Clip etc. (short circuit GND and pin 7)	CN106 X: — Y: pin 6 (FCS ERR) pin 7 GND (short circuit pins 7 and 8.)	•Test mode •Stop mode •F – 1	1. Ych : Connect to pin 6. Short cicuit pin 7 to GND(pin 8). 2. Put in LD test disc, press reverse side of skip key bring F – 0 to F – 1. 3. Press PLAY key and adjust VR604 until the waveform level is 2.6Vp-p ± 0.1V.	
9	TRK servo loop gain adjustment (Perform with either method A or B)	A	VR603	• Oscilloscope • LD test disc • AF oscillator • Resistor(47kΩ)	CN106 X: pin 10 (TRK IN) Y: pin 9 (TRK ERR)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #15,000 STILL	1. Xch : Connect to pin 10 with 47k Ω . Ych : Connect to pin 9. 2. Search #15,000 of LD test disc and still the address. 3. Connect AF oscillator between X ch and 47k Ω and adjust VR603 until Lissajous figure is circle.	
		B	VR603	• Oscilloscope • LD test disc	CN106 X: — Y: pin 9 (TRK ERR)	• Test mode TRK servo ON, Tilt servo ON • F – 1 • LD test disc #15,000 STILL	1. Ych : Connect to pin 9. 2. Search #15,000 of LD test disc and still the address. 3. Adjust VR603 until the waveform level is 1.6Vp-p ± 0.1V.	
10	RF level adjustment	VR601		• Oscilloscope • LD test disc	CN106 pin 3 (RF)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #15,000 STILL	1. Search for address #15,000 of LD test disc, still the address, and observe RF at CH 1. 2. Adjust VR601 until RF amplitude is 300mVp-p ± 50mV.	
11	Coarse centaring adjustment for side B play	Centering asdjustment screw for side B play		• Oscilloscope • LD test disc • MIX resistor 10k 10k • ⊖ Screwdriver (Large)	CN106 X : pin 9 (TRK ERR) Y : pin 1+2 (TRK SUM) (X-Y mode)	• Test mode TRK servo ON/OFF, Tilt servo ON • LD test disc #100 STILL	Note : Be careful not to turn the centering adjustment screw past its limit. 1. Move the carriage assy toward side B and still with test disc #100. (TRK servo ON) 2. Observe TRK ERR (Xch) and TRK SUM (Ych) at the X-Y mode during TRK servo OFF. 3. Turn centering adjustment screw for side B until the Lissajous figure is horizontal.	
12	Tangential direction angle adjustment for side B play	TAN adjustment screw for side B play		• Oscilloscope • LD test disc • ⊕ Scredriver (Medium)	Video output terminal (TV monitor)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #115 STILL	Note : Be careful not to turn the TAN adjustment screw past its limit. 1. Move the carriage assy toward side B and still with test disc #115. (TRK servo ON) 2. Turn TAN adjustment screw for side B until RF waveform amplitude becomes maximum. 3. Check to see that crosstalk on monitor screen is at its minimum.	
13	Fine centering adjustment for side B play	Centering asdjustment screw for side B play		• Oscilloscope • LD test disc • MIX resistor 10k 10k • ⊖ Screwdriver (Large)	CN106 X : pin 9 (TRK ERR) Y : pin 1+2 (TRK SUM) (X-Y mode)	• Test mode TRK servo ON/OFF, Tilt servo ON • LD test disc #100 STILL	Perform fine adjustment again following same steps as in procedure "11. Coarse centering adjustment for side B play".	

2) ELECTRICAL ADJUSTMENT

Note : Be careful of Step No. because of adjustment procedure of CLD-99/KU/CA is different from CLD-79/KU/CA.

Step 99	Step 79	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1		PLL offset adjustment	VR612 (SACB assy)	•DC voltmeter •CD test disc	W317 (Jumper) (SACB assy)	•Test mode/Normal mode Tilt servo ON, TRK servo OFF •Digital sound play	• Place tape on the inner track of CD test disc to create eccentricity. • At track servo OFF, play the innermost track of the above CD. At that time, observe PLL OFFSET voltage (W317 jumper). • Next, take off tape from CD, and play the innermost track again in the normal play. Adjust VR612 until PLL OFFSET voltage value is same as at the time of eccentricity.	
2	–	Phase adjustment	VR101 (SACB assy)	•Oscilloscope •CD test disc	IC391 - pin4, 10 (SACB assy)	•Normal mode •Digital sound play	Connect CH1 of oscilloscope and pin 4 of IC391 to CH2 and pin 10 respectively. When CH2 has been inverted, adjust VR101 so that the waveform phase of CH1 and CH2 match each other (± 5%).	
3	2	Video level adjustment before A/D	VR450 (VIDEO LEV.1) (SACB assy)	•Oscilloscope •LD test disc	IC400 (PA0058A) - pin 12 or W450 (Jumper) (SACB assy)	•Normal mode •LD test disc #19,900 STILL	Connect pin 12 of IC400 and oscilloscope. Observe the video signal during still playback LD test disc #19,900 (composite). Adjust VR450 until level from sync tip to 100% white becomes 1.633Vp-p ± 3%.	
4	3	Master clock adjustment	VC901 (DVDB assy)	•Frequency counter	IC601 - pin 74 (contact needle land) (DVDB ASSY)	•POWER ON •STOP	Connect pin 74 of IC601 (contact needle land) and frequency counter. Adjust VC901 so that the frequency becomes 14.31818MHz ± 10Hz in the power ON (stop).	
5	4	Video level adjustment	VR651 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Video output terminal (75 Ω terminated)	•Normal mode •LD test disc #19,900 STILL	Connect video output terminal and oscilloscope. (video output terminal is terminated with 75 Ω .)(It is possible to terminate video output terminal with 75 Ω by connecting TV monitor.) Observe the video signal during still playback LD test disc #19,900 and adjust VR651 until level from pedestal to 100% white becomes 0.714Vp-p ± 5%.	
6	5	V-SYNC level adjustment	VR652 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Video output terminal (75 Ω terminated)	•Normal mode •LD test disc #19,900 STILL	Connect video output terminal and oscilloscope. (video output terminal is terminated with 75 Ω .)(It is possible to terminate video output terminal with 75 Ω by connecting TV monitor.) During still playback #19,900 of LD test disc, observe video signal with trigger by V rate. Adjust VR652 until V sector's later period parity pulse pedestal (a) and preceding period parity pulse pedestal (b) are equal (± 5%).	
7	6	SYNC level adjustment	VR653 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Video output terminal (75 Ω terminated)	•Normal mode •LD test disc #19,900 STILL	Connect video output terminal and oscilloscope. (video output terminal is terminated with 75 Ω .)(It is possible to terminate video output terminal with 75 Ω by connecting TV monitor.) Observe the video signal during still playback LD test disc #19,900 and adjust VR653 until level from sync tip to pedestal becomes 0.286Vp-p ± 5%.	
8	9	S-C SYNC level adjustment	VR704 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Leg of C output pin of S terminal	•Normal mode •LD test disc #19,900 STILL •S terminal is 75 Ω terminated	Connect C output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) Observe the video signal during still playback LD test disc #19,900 and adjust VR653 until level from sync tip to pedestal becomes 0.286Vp-p ± 5%.	
9	10	S-V SYNC level adjustment	VR705 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Leg of Y output pin of S terminal	•Normal mode •LD test disc #19,900 STILL •S terminal is 75 Ω terminated	Connect Y output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) During still playback #19,900 of LD test disc, observe Y signal with trigger by V rate. Adjust VR705 until V sector's later period parity pulse pedestal (a) and preceding period parity pulse pedestal (b) are equal (± 5%).	
10	8	C output level adjustment	CLD-99/KU/CA: VR101 (TDYC assy) CLD-79/KU/CA: VR703 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Leg of C output pin of S terminal	•Normal mode •LD test disc #19,900 STILL •S terminal is 75 Ω terminated	Connect C output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) Observe the video signal during still playback LD test disc #19,900 and adjust VR101 until the burst level becomes 0.286Vp-p ± 5%.	
11	7	Y output level adjustment	CLD-99/KU/CA: VR102 (TDYC assy) CLD-79/KU/CA: VR702 (DVDB assy)	•TV monitor •Oscilloscope •LD test disc	Leg of Y output pin of S terminal	•Normal mode •LD test disc #19,900 STILL •S terminal is 75 Ω terminated	Connect Y output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) Observe the video signal during still playback LD test disc #19,900 and adjust VR102 until level from sync tip to 100% white becomes 0.714Vp-p ± 5%.	

7. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ PD0205D (IC101 : SACB assy)

•Mechanism Control Microcomputer

• Pin Function

No.	Pin name	I/O	Function
1	VCC	I	Power connection pin. . Apply 5V ± 10%.
2	FBAL	O	Focus balance control . "L"=RFMAX, "H"=TEMAX
3	XCD	O	LD/CD switch signal output. "L"=CD, "H"=LD
4	DIRECT	O	Power OFF signal output of CD direct video section. "L"=Normal, "H"=Video PW OFF
5	SRDDISC	O	AC3 pin OFF signal output. "L"=Normal, "H"=AC3 disc
6	SLDPOS	I A/D	Pickup position detection switch input. Divides the resistance among the switches, reads the value of the A/D input, and detects the position.
7	TILTERR	I A/D	The signal is A/D converted and is input as the tilt servo control. Controls the tilt motor until the signal is 2.5V.
8	TBALERR	I A/D	Tracking balance error signal input. The signal is A/D converted and is input as the tracking offset control.
9	SLDERR	I A/D	The signal is A/D converted and is input as the slider servo control. Controls the slider motor until the signal is 2.5V.
10	THOLD	I	Track jump during accelerating/decelerating signal input. "L"=other, "H"=during accelerating/decelerating
11	FSEQ	I	Subcode sync. conformity detection signal input. "L"=Not conformity, "H"=Conformity
12	SLDDRV	O PWM	Slider control signal output. 5V=FWD, 0V=REV, 2.5V=STOP Cycle;910 μ sec, 3-value control H, L, Z
13	WRQ	I	Subcode Q reading OK signal input. "L"=NG, "H"=OK If the subcode Q data is passed for CRC check, this pin becomes H.
14	RWC	O	DSP reading/writing command signal signal output. "L"=READ, "H"=WRITE
15	SQOUT	I	Command data input from DSP. SUBQ is read out.
16	COIN	O	Command data output to DSP.
17	CQCK	O	DSP reading/writing command clock output. Read at start-up.
18	TBALDRV	O PWM	Outputs the tracking offset after PWM and is used in auto tracking offset. Cycle;910 μ sec, 3-value control H, L, Z
19	SI1	I	Data input from mode control IC.
20	SO1	O	Serial data output to mode control IC.
21	SCK1	I/O	Clock for serial communication with mode control IC. In the input mode except during serial communication with mode control IC.
22	TZC	I INT	Tracking error zero cross signal input. In the miss clamp detection, monitor this signal in track count search.
23	CDG	O	Output pin during CD-G playback. "L"=other, "H"=during CD-G playback
24	TILTDRV	I/O	LOAD/TILT control output. 0.5V:Tray IN, OUT/Tilt DOWN, UP, 2.5V:STOP Outputs the tilt drive after PWM and is used in tilt servo.
25	SHAKE	I/O	Hand shake signal for data communication with mode control IC. This pin is a bi-directional data path which sends the data transfer timing through the I/O mode switching of the respective microcomputers.
26	XPBV	I	LD/CDV playback vertical sync. signal input . "L"=V-SYNC ongoing
27	CNVss	I	GND for A/D conversion.
28	XRESET	I	Reset signal input. "L"=Reset, "H"=Cancel reset by controlling mode control IC.
29	XIN	I	9MHz clock oscillation input.
30	XOUT	O	9MHz clock oscillation output.
31	N.C.	O	Not used.
32	GND	I	Ground.
33	XFOK	I	Focus servo lock signal input. "L"=Lock, "H"=Unlock Use for detecting the focus servo lock.
34	XO9	I	Model switch port. "L"=CLD-D99, CLD-99, "H"=CLD-79
35	XFORE	I	Model switch port. "H"=Japan, "L"=Others
36	WFM	I	DVP odd/even number field determination signal input. "L"=Even, "H"=Odd
37	FG	I	Spindle motor FG signal input. 24 pulses per signal, divided into thirds and used inside the microcomputer.
38	DATA	I	Input pin for Phillips code decoder with built in mechanism controller.
39	XPBH	I	Playback H-SYNC input for Phillips code decode.
40	XPBV	I	Playback V-SYNC input for Phillips code decode.
41	SQ2	O	Analog audio switch signal output. 2/R "L"=Normal, "H"=Mute
42	SQ1	O	Analog audio switch signal output. 1/L "L"=Normal, "H"=Mute
43	XCX	O	Analog audio CX noise reduction switch signal output. "L"=CX ON, "H"=CX OFF
44	MUTE	O	Audio mute control signal output of audio section.. "L"=Cancel MUTE, "H"=MUTE
45	XANA	O	Digital/analog audio switch signal output. "L"=Analog, "H"=Digital
46	MCNTLAT	O	PD3212A serial latch signal output. Latches at falling edge.
47	TDLAT	O	GGC1019 (UPD6480GF-3BA) and GGC1064 (UPD6481GC-3B6) serial latch signal output. "L"=during commnication, "H"=other
48	DGFLAT	O	PD0116A serial latch output. Latches at falling edge.
49	RFCORR	O	RF correction switch signal output. "H"=Gain up, CAV inner circuit gain up
50	XLDG	O	Graphic code detection output. "L"=other, "H"=Detects the graphic code and selects the graphic mode.
51	DVPLAT	O	PD0146A serial latch signal output. Latches at falling edge.
52	SCK3	O	Serial 3 clock signal output.
53	SO3	O	Serial 3 data signal output. With the serial signal as the common signal, divides the signals into three types of latch signals (DVPLAT, TDLAT and DGFLAT).
54	SLOCK	I	Spindle lock signal input. "L"=Unlock, "H"=Lock
55	DATAINH	O	Output pin that carries out Phillips code data inhibit. "L"=Inhibit, "H"=Permit
56	XCLV	O	CAV/CLV switch signal output. "H"=CAV, "L"=CLV
57	NRINH	O	NR control pin. "L"=Normal, "H"=no NR
58	XPLAY	O	Output pin during spindle servo. "L"=During servo, "H"=Acceleration, brake, during STOP
59	SW1	I	Switch input for loading/tilt position detection.
60	SW2		
61	SW3		
62	DETAMP	I	Spindle overcurrent detection signal input. "L"=Overcurrent, "H"=Normal
63	XTURNB	I	γ turn position detection signal input. "L"=Side B, "H"=Side A, during turn
64	XTURNA	I	γ turn position detection signal input. "L"=Side A, "H"=Side B, during turn

■ PD3295B (IC101 : FLKY assy)

•Mode Control Microcomputer

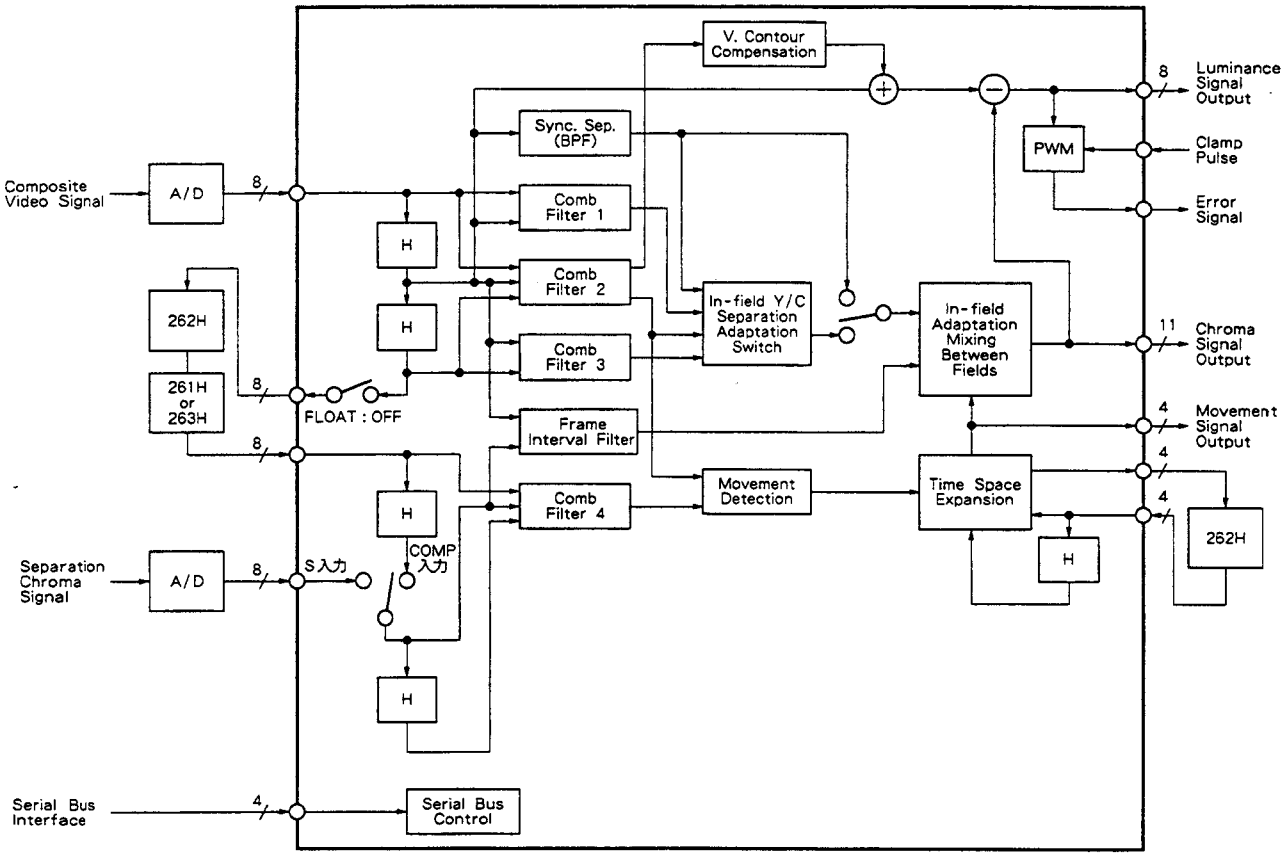
• Pin Function

No.	Pin name	I/O	Function	No.	Pin name	I/O	Function
1	VCC	I	Power supply voltage (+5V).	31	J/KU	I	Destination switch port (L : Japan, H : Others).
2	G-CS	O	Graphics decoder communication requirement output.	32	LED1	O	LED output : FL OFF
3	XSCK	I/O	Serial communication clock.	33	A	O	Display segment output.
4	S-MTOF	I	Serial communication data input.	34	B		
5	S-FTOM	O	Serial communication data output.	35	C		
6	XRESET (OUT)	O	Reset output of the SACB assy.	36	D		
7	XCS	O	Character generator (PD0154A) communication requirement output.	37	E		
8	SYNCHRO	I	CD deck synchro input.	38	F		
9	SYNCHRO	O	CD deck synchro output.	39	G		
10	AVCC	I	+5V.	40	H (Ks0)	O	Display segment output / Key scan output.
11	KIN0	I	Key data input.	41	I (Ks1)		
12	KIN1			42	J (Ks2)		
13	KIN2			43	K (Ks3)		
14	KIN3			44	L	O	Display segment output.
15	KIN4			45	M		
16	CDGM	I	Graphics decoder and graphics mode input.	46	N		
17	PO6	I	Not used (GND).	47	O		
18	7G/9G	I	Model switch port. (L:CLD-79, H:CLD-D99, CLD-99)	48	Vdisp	I	FL power supply voltage (− 27V).
19	AVss	I	GND.	49	P	O	Display segment output.
20	TEST	I	GND.	50	Q		
21	X2	O	Not used (N.C.).	51	R		
22	X1	I	+5V.	52	G9	O	Display grid output.
23	Vss	I	GND.	53	G8		
24	OSC1	I	Oscillator (8MHz).	54	G7		
25	OSC2	O		55	G6		
26	XRESET(IN)	I	CPU reset (L : Reset).	56	G5		
27	SHAKE (ACK)	I/O	Mecha. control communication requirement input. (Mode control communication permission output).	57	G4		
28	SEL IR	I	Remote control input.	58	G3		
29	P. ON	O	Power supply source switch output of the SACB assy.	59	G2		
30	W.D.F	O	Pulse output for WATCH DOG.	60	G1		
				61	LED2	O	LED output : Direct CD.
				62	LED3	O	LED output :Theater mode
				63	AC-3	I	AC-3 switch port (L : Uncorrespondence, H:Correspondence).
				64	MUTE	O	Graphics decoder and data mute output.

■ GGC1019 (UPD6480GF-3BA)(IC151 : TDYC assy)(CLD-99 ONLY)

•Y/C Separation and Movement Detection for EDTV

• Block Diagram



• Pin Function

No.	Pin	Pin Name	I/O	Function
1	V_{DD}	Power supply	–	Supplies a 5V (typical) operating power voltage.
2	CLPO	Clamp D/A output	O	Outputs the difference between the clamp level and the video (pedestal) level in PWM. The pulse width changes between 1/16 and 15/16 in a 4.4 μs cycle.
3 ~ 10	$V0H_7$ ~ $V0H_0$	Video input (0H delay) /Luminance input	I (SB)	Input an 8-bit signal which is obtained through A/D conversion of the video signal. In S-terminal mode, these pins accept the luminance signal. The pedestal level is of 64 levels. ($V0H_7$: MSB, $V0H_0$: LSB)
11 ~ 18	$V2H_7$ ~ $V2H_0$	Video output (2H delay)/ Burst-added main signal output	O (SB)	Output a signal which is obtained by delaying the video signal by 2H. In S-terminal mode, these pins output the signal which is obtained by adding the burst of the chroma signal, which is supplied to pins 92 to 99 (CS), to the main signal. ($V2H_7$: MSB, $V2H_0$: LSB)
19 ~ 26	$F0H_7$ ~ $F0H_0$	Video input (1-frame delay)	I (SB)	Input a signal which is obtained by delaying the video signal by 1 frame. In S-terminal mode, these pins accept the signal which is obtained by delaying the main signal by 1 frame, for Δ Y detection between frames. ($F0H_7$: MSB, $F0H_0$: LSB)
27, 28	MD_2, MD_1	S-terminal mode output	O	Output a signal to control the delay of memory connected to an external device or the output enable in S-terminal mode. S-terminal mode : MD_2="H", MD_1="L"
29	CK_A	Clock output	O	Used as the clock for memory connected to an external device or for A/D conversion. It has a delay of 10 ns (typical) with respect to the input at pin 33 (CLK).
30	V_{DD}	Power supply	–	Supplies a 5V (typical) operating power voltage.
31	GND	Ground	–	0V potential for ground.
32	CK_B	Clock output	O	Used as the clock for memory banks connected to an external device or for A/D conversion. It has a delay of 10 ns (typical) with respect to the input at pin 33 (CLK).

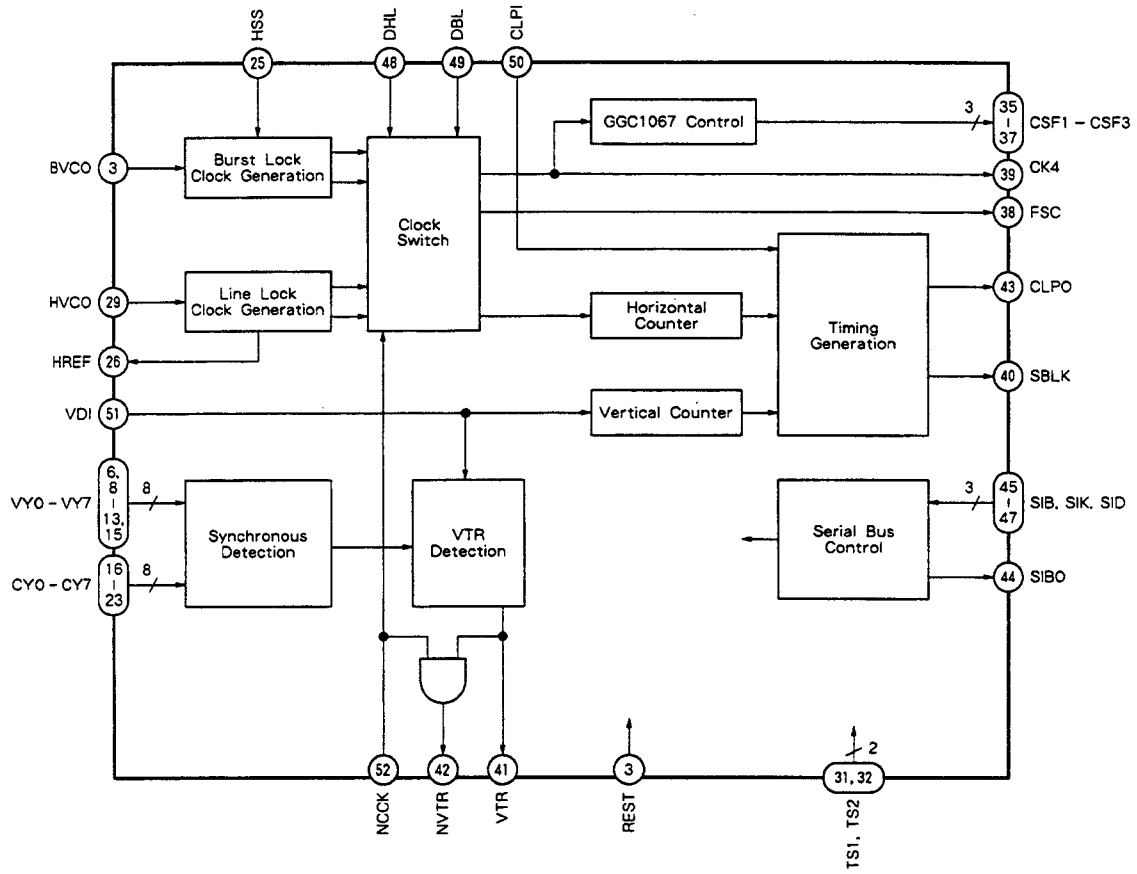
No.	Pin	Pin Name	I/O	Function
33	CLK	Clock input	I	Input a clock of 4 fsc (14.31818 MHz).
34	CLPI	Clamp pulse input	I	Reads the video signal 13 clock pulses before at the falling edge of an active "H" clamp pulse and compares it with the clamp level (64 levels).
35	TMR	Test input	I	Input pin for testing. To be connected to V_{DD} or open.
36	BLK	Blanking input	I	Input a signal which is "H" for blanking, three clock pulses after the main signal. During blanking, the vertical contour compensation and synchronization protection are turned off, and Y/C separation is set to Frequency Separation mode.
37	LINE	Y/C separation forced line input	I	Set it to "H" to fix the Y/C separation to In-field Y/C Separation mode.
38	MIL	Forced movement input of movement output	I	Set it to "H" to forcibly set movement detection output at pins 46 to 49 (MI) to "H".
39	SIBO	Serial bus busy output	O	Supplies a busy signal for serial bus acknowledge return. Wire-connected with pin 40 (SIBI), this pin outputs "L" for the return.
40	SIBI	Serial bus busy input	I	Input a busy signal for serial bus data reception. Data reading starts when the signal at this pin is "L", and the initial status of data reading is resumed when "H".
41	SIK	Serial bus clock input	I	Input the clock signal for serial bus data reception. The input data at pin 42 (SID) are read at the rising edge of this clock.
42	SID	Serial bus data input	I	Input serial bus data. It reads data in synchronization with the input clock at pin 41 (SIK).
43	FIL_3	Filter selection 3	I	Switches the filters for Δ Y detection between frames. Normally to be connected to GND or open.
44	FIL_1	Filter selection 1	I	Set to "H" to switch from In-field Y/C Separation mode to Frequency Separation mode. Normally connect this pin to TIG interleave detection output.
45	FIL_2	Filter selection 2	I	Switches the bandwidth of the chroma signal for in-field Y/C separation. Narrow bandwidth is selected when the signal at this pin is "H". Normally to set it to "L".
46 ~ 49	MI_0 ~ MI_3	Movement detection output	O (SB)	Expand the movement signal and output it with a delay of 13 clock pulses with respect to the main signal. (MI_3 : MSB, MI_0 : LSB)
50	GND	Ground	–	0V potential for ground.
51	V_{DD}	Power supply	–	Supplies a 5V (typical) operating power voltage.
52	KIL	Killer input	I	Set this pin to "H" to output the luminance without subtracting the chroma from the main signal.
53 ~ 63	C_0 ~ C_A	Chroma output	O (2'S)	Outputs the chroma which is obtained through Y/C separation of the video signal, with a delay of 17 clock pulses with respect to the main signal. The gain is × 2 for composite inputs or × 1 in S-terminal mode. The gain in each case can be halved by the serial bus. (C_A : MSB [SIGN], C_0 : LSB)
64	CV_A	Chroma inverse output	O	Outputs the inverse of the MSB of the chroma output at pin 63 (C_A). Use this pin for the MSB when connecting D/A to the chroma outputs.
65 ~ 72	Y_0 ~ Y_7	Luminance output	O (SB)	Output the luminance which is obtained through Y/C separation of the video signal, with a delay of 17 clock pulses with respect to the main signal. (Y_7 : MSB, Y_0 : LSB)
73 ~ 75	TES_1 ~ TES_3	Test input	I	Input pins for testing. To be connected to GND or open.
74 ~ 79	TES_4 ~ TES_7	Test output	O	Output pins for testing.
80	V_{DD}	Power supply	–	Supplies a 5V (typical) operating power voltage.
81	GND	Ground	–	0V potential for ground.
82	TES_8	Test output	O	Output pin for testing.
83	TES_9	Test input	I	Input pin for testing. To be connected to GND or open.
84 ~ 87	LB_0 ~ LB_3	Movement expansion input	I (SB)	Accept the output for movement expansion being supplied from pins 88 to 91 (LA) with a delay of 262H. (LB_3 : MSB, LB_0 : LSB)
88 ~ 91	LA_0 ~ LA_3	Movement expansion output	O (SB)	Output pins to expand the movement signal. (LA_3 : MSB, LA_0 : LSB)
92 ~ 99	CS_7 ~ CS_0	Chroma input	I (SB)	Accept the chroma signal in S-terminal mode. Connect them to GND when S-terminal mode is not used. (CS_7 : MSB, CS_0 : LSB)
100	GND	Ground	–	0V potential for ground.

Notes ; (SB) : Data are in the form of straight binary codes.
(2'S) : Data are in the form of two's complement codes.

■ GGC1064 (UPD6481GC-3B6)(IC152 : TDYC assy)(CLD-99 ONLY)

•Timing Generation for Three-dimensional Y/C Separation

- **Block Diagram**



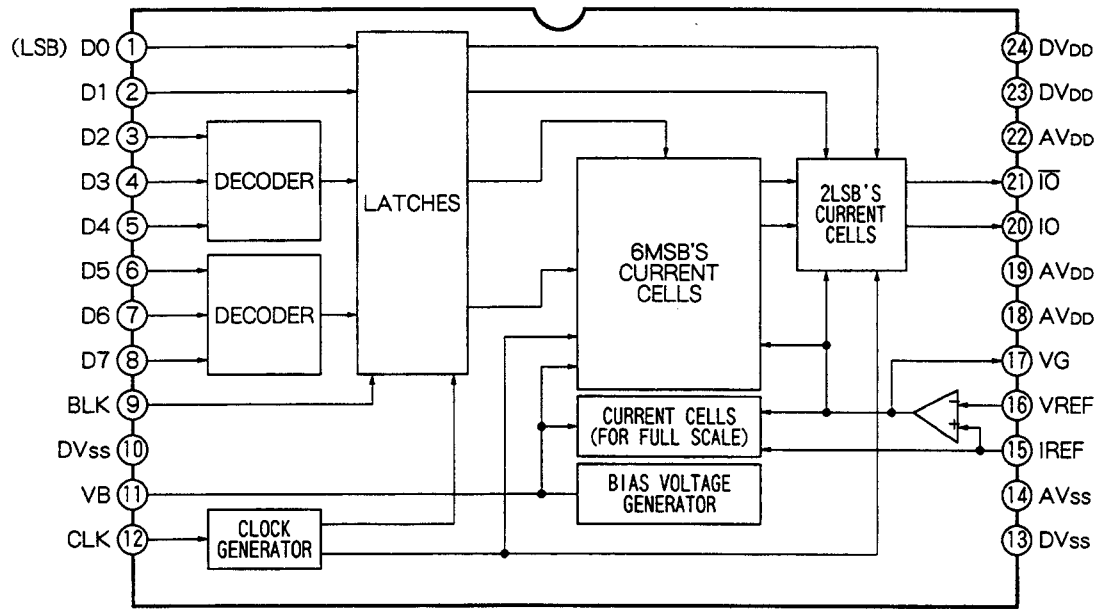
• Pin Function

No.	Pin name	I/O	Function
1	GND	–	0V : potential for ground
2	BXT	O	Output for testing. 4fsc is output.
3	BVCO	I	Input the VCO oscillation clock of burst lock PLL. 4fsc (14.3MHz) is input.
4	VDD	–	+5V (TYP.) Apply a power voltage.
5	REST	I	Input pin for forced reset. Normally, to be connected GND or open.
6	VY0	I	Input the Y signal with burst signal. Output from YCS Ⅲ. (VY0 : LSB)
7	GND	–	0V : potential for ground
8 ~ 13	VY1 ~ VY6	I	Input the Y signal with burst signal. Output from YCS Ⅲ.
14	N.C.	–	No connection.
15	VY7	I	Input the Y signal with burst signal. Output from YCS Ⅲ. (VY7 : MSB)
16 ~ 23	CY0 ~ CY7	I	Input the signal with a delay of 1 field (262H) with respect to VY inputs. (CY0 : LSB, CY7 : MSB)
24	HOEB	I	Input for testing.
25	HSS	I	Input the horizontal frequency for AFC loop.
26	HREF	O	Output the reference signal to line lock PLL. 910fH (14.3MHz) signal which is input from HVCO pin divide into 910 and fH (15.734kHz) is output.
27	GND	–	0V : potential for ground
28	HXT	O	Output for testing. 910fH is output.
29	HVCO	I	Input the VCO oscillation clock of line lock PLL. 910fH (14.3MHz) is input.
30	VDD	–	+5V (TYP.) Apply a power voltage.
31	TS2	I	Input for testing. Normally, to be connected GND or open.
32	TS1	I	Input for testing. Normally, to be connected GND or open.
33	GND	–	0V : potential for ground
34	VDD	–	+5V (TYP.) Apply a power voltage.
35 ~ 37	CSF1 ~ CSF3	O	Memory control output for GGC1019 (UPD6480GF-3BA).
38	FSC	O	Output to FSC pin of YCP Ⅱ. Reference phase output of fsc (3.58MHz).
39	CK4	O	4fsc (14.3MHz) clock for system.
40	SBLK	O	Input the signal (for sync protection of YCS Ⅲ) to BLK pin of YCS Ⅲ. (Active is High.)
41	VTR	O	Hi-level is output by detecting the non standard signal. Input to line pin of YCS Ⅲ.
42	NVTR	O	Hi-level is output when detecting the non standard signal in the three-dimensional Y/C separation mode. Low-level is always output in the luminance signal NR mode.
43	CLPO	O	Pulse output for clamping the video signal of A/D immediately. (Active is High.)
44	SIBO	O	Busy output for ACK answer of serial bus.
45	SIB	I	Busy input of serial bus.
46	SIK	I	Clock input of serial bus.
47	SID	I	Data input of serial bus.
48	DHL	I	System clock is forced became line lock clock in the Hi-level. It becomes auto switch in the Low-level.
49	DBL	I	System clock is forced became burst lock clock in the Hi-level. It becomes auto switch in the Low-level.
50	CLPI	I	Input the clamp pulse. (Active is High.)
51	VDI	I	Input the vertical synchronizing pulse which is sync. separated fro the video signal. (Active is Low.)
52	NCCK	I	H :Three-dimensional Y/C separation mode, L : Luminance signal NR mode

■ CXD1171M (IC604 : DVDB assy)

•8-bit 40 MSPS D/A Converter

• Block Diagram



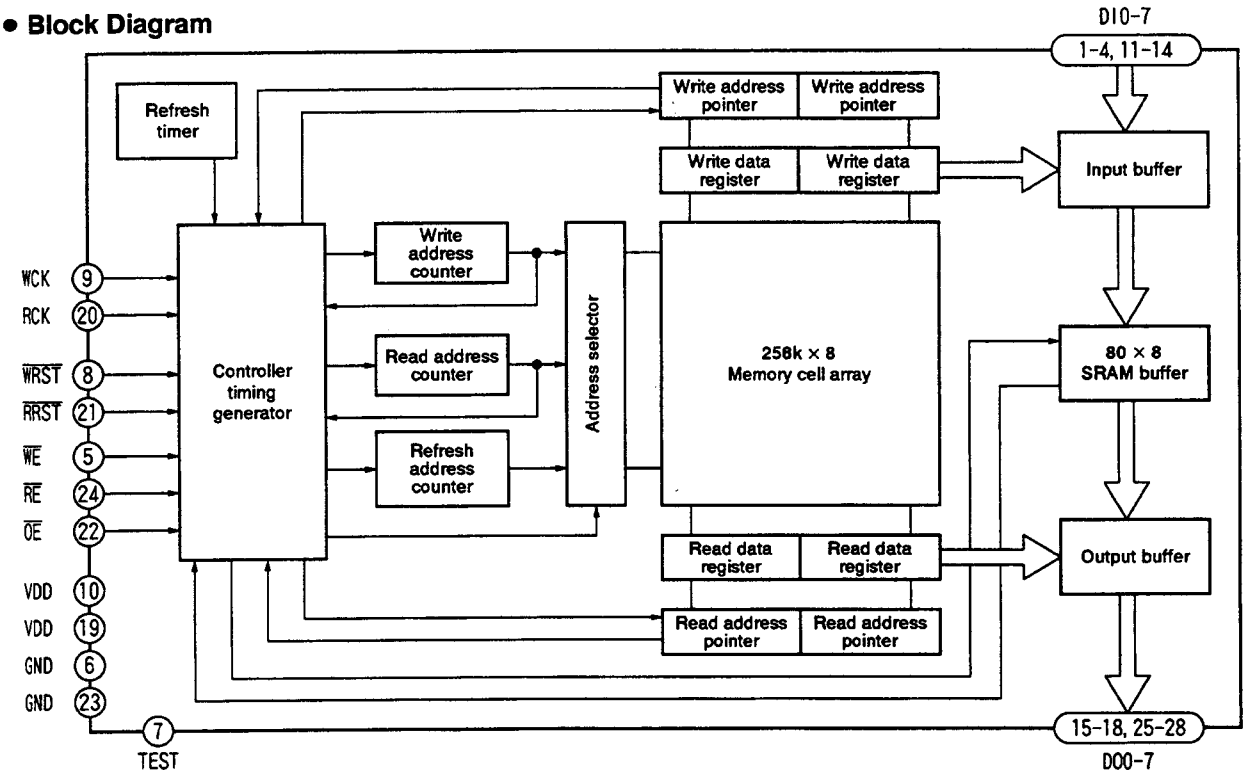
• Pin Function

No.	Pin name	Function
1~8	D0~D7	Digital input.
9	BLK	Blanking pin. "H" for no signal (output 0V), "L" for output.
11	VB	Connect a 0.1 μF degrees of capacitor.
12	CLK	Clock pin. Input pins are all compatible with TTL-CMOS.
10, 13	DVss	Digital GND.
14	AVss	Analog GND.
15	I_{REF}	Connect a "16R" (16 times) resistor against to output resistance value "R".
16	V_{REF}	Set the output full scale value.
17	VG	Connect a 0.1 μF degrees of capacitor.
18, 19, 22	AV_{DD}	Analog V_{DD}
20	IO	Current output pin. Produce the output by connecting resistor.
21	$\overline{IO}$	Inversion current output pin. Normally, connect to analog GND.
23, 24	DV_{DD}	Digital V_{DD}

■ UPD42280GU-30 (IC153, IC154 : TDYC assy)(CLD-99 ONLY)

·2M Fieldmemory IC

• Block Diagram



• Pin Function

No.	Pin Name	I/O	Function
1	DI0	I	Write data inputs. Data acceptance is done at the rising edge after the WCK input cycle, and setup and hold time (t_{DS}, t_{DH}) are defined.
2	DI1		
3	DI2		
4	DI3		
5	$\overline{WE}$	I	Write operation control input. When at the high level, internal write operations are inhibited and the write address pointer stops and remains at the current location.
6	GND	—	Ground
7	TEST	I	For testing. To be fixed at the low level.
8	$\overline{WRST}$	I	Reset input to initialize the write address. Reset signal acceptance is done at the rising edge before the WCK input cycle, and setup and hold time (t_{RS}, t_{RH}) are defined.
9	WCK	I	Write clock input. A write operation is done in synchronization with write clock when $\overline{WE}$ is at the low level, and the write address pointer is incremented at the same time.
10	VDD	—	+5V power supply
11	DI4	I	Write data inputs. Data acceptance is done at the rising edge after the WCK input cycle, and setup and hold time (t_{DS}, t_{DH}) are defined.
12	DI5		
13	DI6		
14	DI7		
15	DO7	O	Read data outputs. The access time is determined from the rising edge before the RCK cycle and defined as t_{AC}. These are 3-state outputs.
16	DO6		
17	DO5		
18	DO4		
19	VDD	—	+5V power supply
20	RCK	I	Read clock input. A read operation is done in synchronization with read clock and, when $\overline{RE}$ is at the low level, the read address pointer is simultaneously incremented.
21	$\overline{RRST}$	I	Reset input to initialize the read address. Reset signal acceptance is done at the rising edge before the RCK input cycle, and setup and hold time (t_{RS}, t_{RH}) are defined.
22	$\overline{OE}$	I	Read data control input. When at the high level, DO0 – 7 are set to high impedance. Regardless of the input level of the $\overline{OE}$ signal, the read address pointer is incremented in synchronization with RCK.
23	GND	—	Ground
24	$\overline{RE}$	I	Read operation control input. When at the high level, internal read operations are enabled, but the read address pointer stops and remains at the current location.
25	DO3	O	Read data outputs. The access time is determined from the rising edge before the RCK cycle and defined as t_{AC}. These are 3-state outputs.
26	DO2		
27	DO1		
28	DO0		

8. CIRCUIT DESCRIPTION

8.1 MODE CONTROL

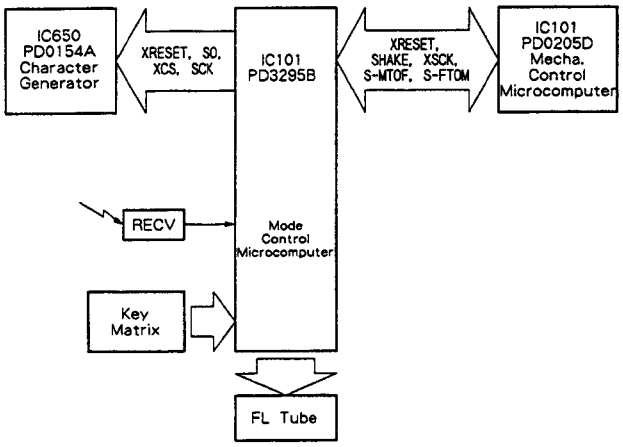


Fig. 1 Mode control block diagram

8.1.1 Microcomputer Interface

The microcomputer system of this model consists of two chips, an 8-bit microcomputer (IC101 : PD0205D) which controls the mechanism and an 8-bit microcomputer (IC101 : PD3295B) which controls the operations and displays.

These two microcomputers are connected via a serial interface. The communication lines are also used for controlling the character generator IC (IC650 : PD0154A).

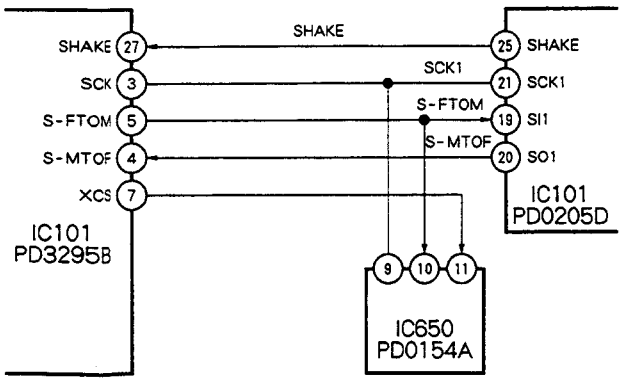


Fig. 2 Serial interface connection diagram

8.1.2 Microcomputer Communication Sequence

1. The PD0205D sets the SHAKE terminal (pin 25) to "L" for several microseconds as a request to the PD3295B for the start of a communication.
2. When the PD3295B receives the communication start request, it sets the SHAKE terminal (pin 27) to "L" and informs the PD0205D that it is ready for communication.
3. The PD0205D then sets SCK1 (pin 21), which has been used as an input port, to output mode, The PD3295B sets SCK (pin 3) to the input mode, connecting the communication lines between the microcomputers.
4. The PD0205D sends the transfer clock (562.5kHz) in 8 bits. The data are then sent and received in synchronization with this clock.
5. When PD3295B receives data of 8 bits, it sets the SHAKE terminal (pin 27) to "H" and reports that a single communication is completed.
6. The PD0205D sets SCK1 (pin 21) to input mode, and the PD3295B sets SCK (pin 3) to output mode. The communication line is thereby disconnected and a single communication is completed.

- The communication takes place within a cycle between 10 and 30 ms. Twelve bytes of data are transmitted at one time.

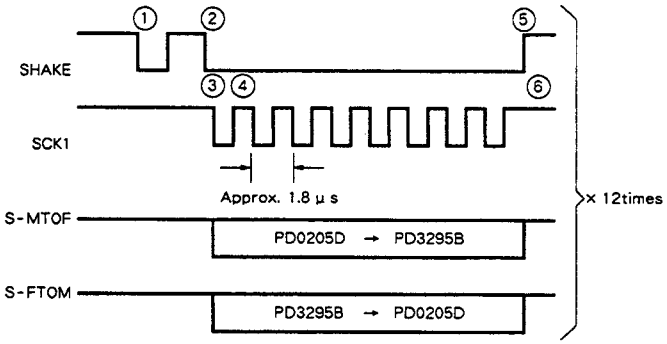


Fig. 3 Timing chart of the microcomputer interface

- The handshake is done on a single line. Both the PD0205D and PD3295B use a single port for both input and output. The port is set to output mode when the output is "L". In other conditions, it will be set to input mode (high impedance). Before "L" is output, both ports mutually confirm that the SHAKE terminal is "H". This is to prevent signal interference between tray output signals.

- The communication data is append with a check code to prevent transfer errors. If sixteen consecutive transfer errors are detected, the PD3295B will send the reset signal to the PD0205D to reset it to its initial state. This will also happen when the communication is not executed for 300 ms or longer.

8.1.3 Direct CD

When playing a compact disc, the following operations are executed by setting the Direct CD switch to ON.
(Microcomputer control)

① The switch incorporated with a lamp lights up and Direct CD mode is initiated.
② Power to certain blocks of the video system that are not used for CD playback is turned off.
(No indication is issued.)
③ The slider park position is set to the position to start a CD.
④ The small tray for CDs is extruded when Tray-Close status is switched to Open status.

These operations decrease the time until the CD play starts after the PLAY button is pressed to approx. two-third. In addition, turning off the unnecessary blocks enables pure audio playback.

If you set the Direct CD switch to ON when the tray is open, the switch incorporated with a lamp flashes from the time the tray begins to close until disc distinguishing finishes. When disc distinguishing is completed, the switch lights for a CD, a CLD or no disc. For an LD, the switch goes dark and Direct CD mode is automatically released. The Direct CD switch cannot be turned ON during LD playback.
When playing a CDV disc, the video system is temporarily turned on for the video portion, without releasing Direct CD mode. The normal Direct CD mode is retrieved when the playback of the video portion is finished.

8.1.4 Outline of the Mode-Control System

(1) Description of the Mode Microcomputer

The mode microcomputer performs the following operations.

① Main unit key/remote control signal processing
Reading the key switch signal from the main unit and remote control signals, it executes the specified operations.
② FL display
It performs display on the FL tubes (VAW1037).
③ Screen display
It controls the character generator IC (PD0154A) and superimposes characters on the screen.
④ Control of the mechanism-control microcomputer
It directs the mechanism-control microcomputer (PD0 205D) for operations and simultaneously accepts some information, including the time and level data.
⑤ Management of system reset
If any trouble occurs in communication with the mechanism-control microcomputer, it resets the system to the default condition.

(2) Film Mode

This is a mode specially designed for playing back a movie program from an LD. By setting the Film Mode switch to ON while an open/stop or play operation is being executed, the following operations are executed.

① The Film Mode LED lights and Film Mode is initiated.
② The FL-OFF LED simultaneously lights and the FL display is turned off.
③ The screen displays other than the input displays (program, search, etc.) go out in 2 seconds after the key is pressed.
④ One-shot memory in the reverse operation is deactivated.
⑤ TOC reading at the playback beginning and reverse operation is deactivated.

These operations decrease the reverse time, enabling smooth reverse operation of movie programs. The time to switch from stop status to playback is also decreased, making this mode effective also as a quick start mode.
Film mode is automatically released when a CD is played.

(3) V-DNR (picture-quality control)

The mode-control IC (PD3295B) sends the NR-control steps to the mechanism-control IC (PD0205D).

The control values can be changed in a total of 10 steps from 0 to 9 individually for Y and C of the video signal.

The relationships between the steps and NR values are shown below.

Step	Y-NR	C-NR
0	OFF	OFF
1	Minimum value	Minimum value
•••	•••	•••
5	Standard value	Standard value
•••	•••	•••
9	Maximum value	Maximum value

The mode-control IC sends step 0 for both Y and C in OFF mode and sends step 5 both for Y and C in STANDARD mode.

In Select mode, any step from 0 to 9 can be selected with the shuttle ring and sent to the mechanism-control IC.

(4) V-DNR, 3D

The mode-control IC (PD3295B) sends the three-dimensional Y/C control steps to the mechanism-control IC (PD0205D).

The settings of the three-dimensional Y/C and the contour compensation can be changed in a total of 10 steps from 0 to 9.

The mechanism-control IC determines the three-dimensional Y/C setting according to these steps.

The relationships between the steps and settings are shown below.

Step	3D. Y/C	SHARPNESS
0	OFF	OFF
1	Minimum value	Minimum value
•••	•••	•••
5	Standard value	Standard value
•••	•••	•••
9	Maximum value	Maximum value

The mode-control IC sends step 5 both for the three-dimensional Y/C and contour compensation in OFF and STANDARD mode.

In Select mode, both three-dimensional Y/C and contour compensation can be set to any step from 0 to 9 with the shuttle ring and sent to the mechanism-control IC.

8.2 Movement-adaptable three-dimensional Y/C separation

The digital video signal supplied to pins 3 to 10 of the three-dimensional IC [IC151: GGC1019 (UPD6480GF--3BA)] is directly output from pins 11 to 18, is delayed for 1 frame by two field buffers and becomes a C signal after accepting an arithmetic operation with a newly supplied signal (Fig. 4).

The input signal is simultaneously separated by the line comb filter into Y and C signals before and after a delay of 1 frame (Figs. 6 and 7).

The differences before and after the delay are used to switch three-dimensional and two-dimensional mixing modes as the reference for movement detection.

The Y and C signals before the delay are also used as the 3-line Y/C separation signals in 2-dimensional operations.

In three-dimensional operations, the Y signal passes through the vertical contour compensation circuit in the form of a composite signal, and is output after the C signal is subtracted by three-dimensional separation.

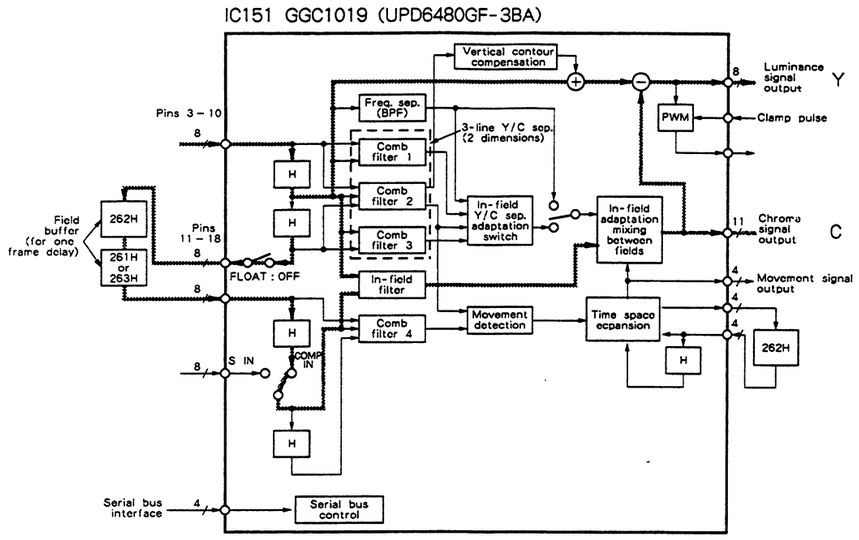


Fig. 4

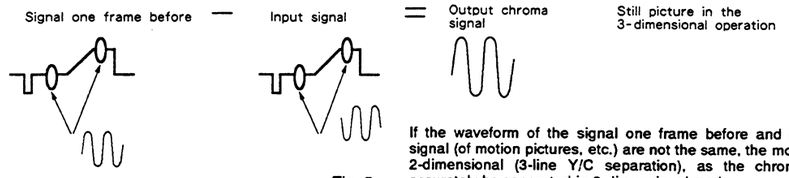


Fig. 5

If the waveform of the signal one frame before and that of the input signal (of motion pictures, etc.) are not the same, the mode is switched to 2-dimensional (3-line Y/C separation), as the chroma may not be accurately be separated in 3-dimensional mode.

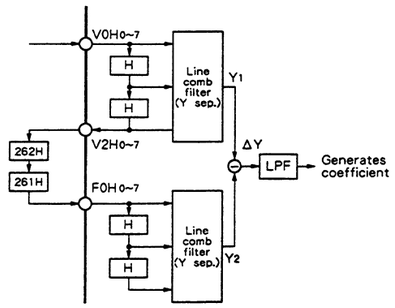


Fig. 6 Y difference detection circuit

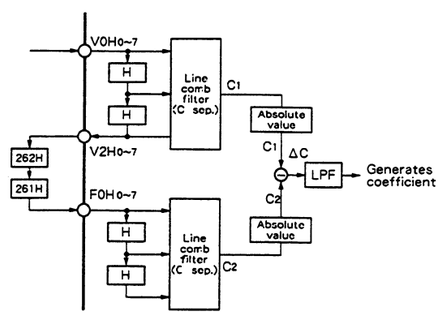
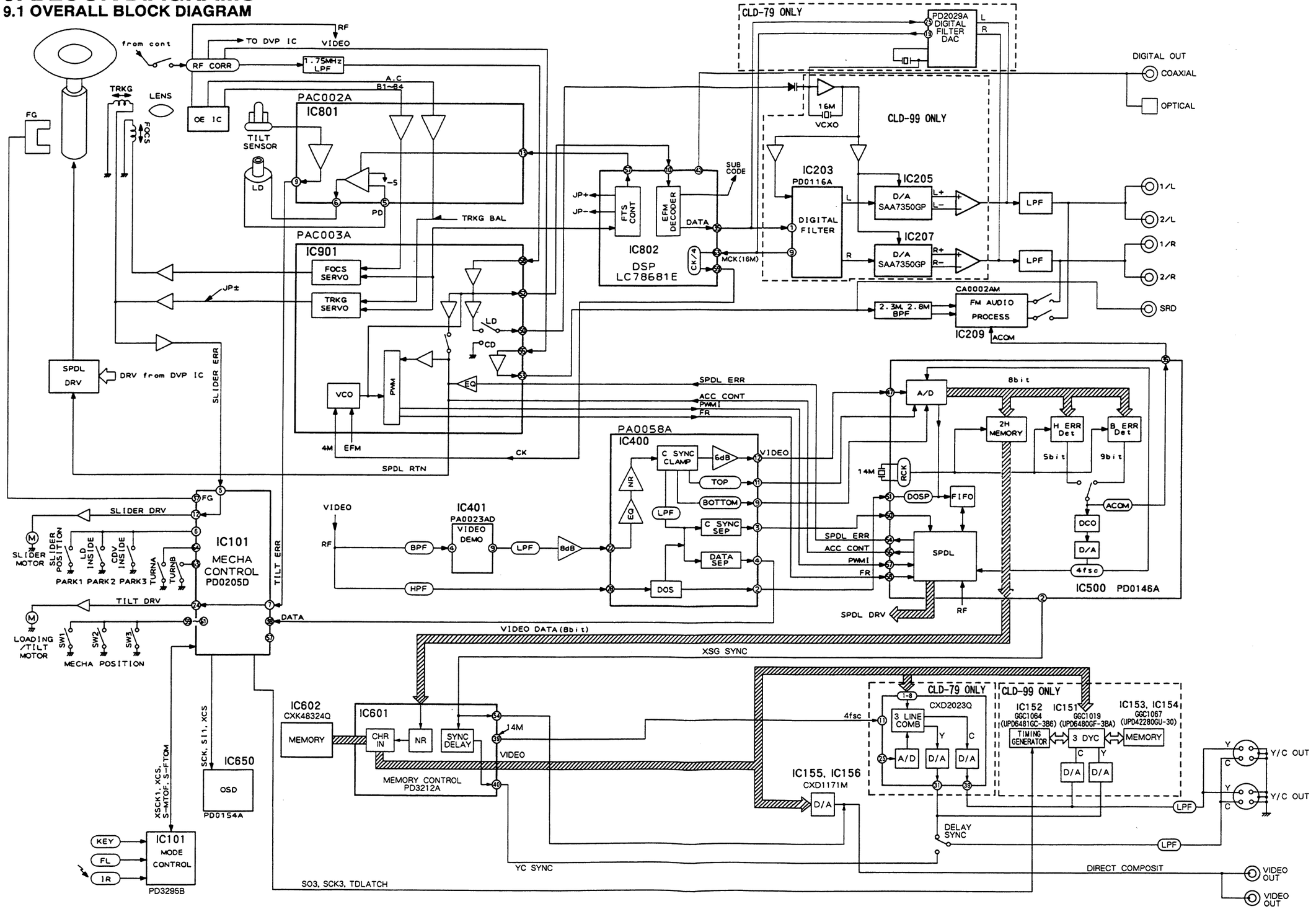


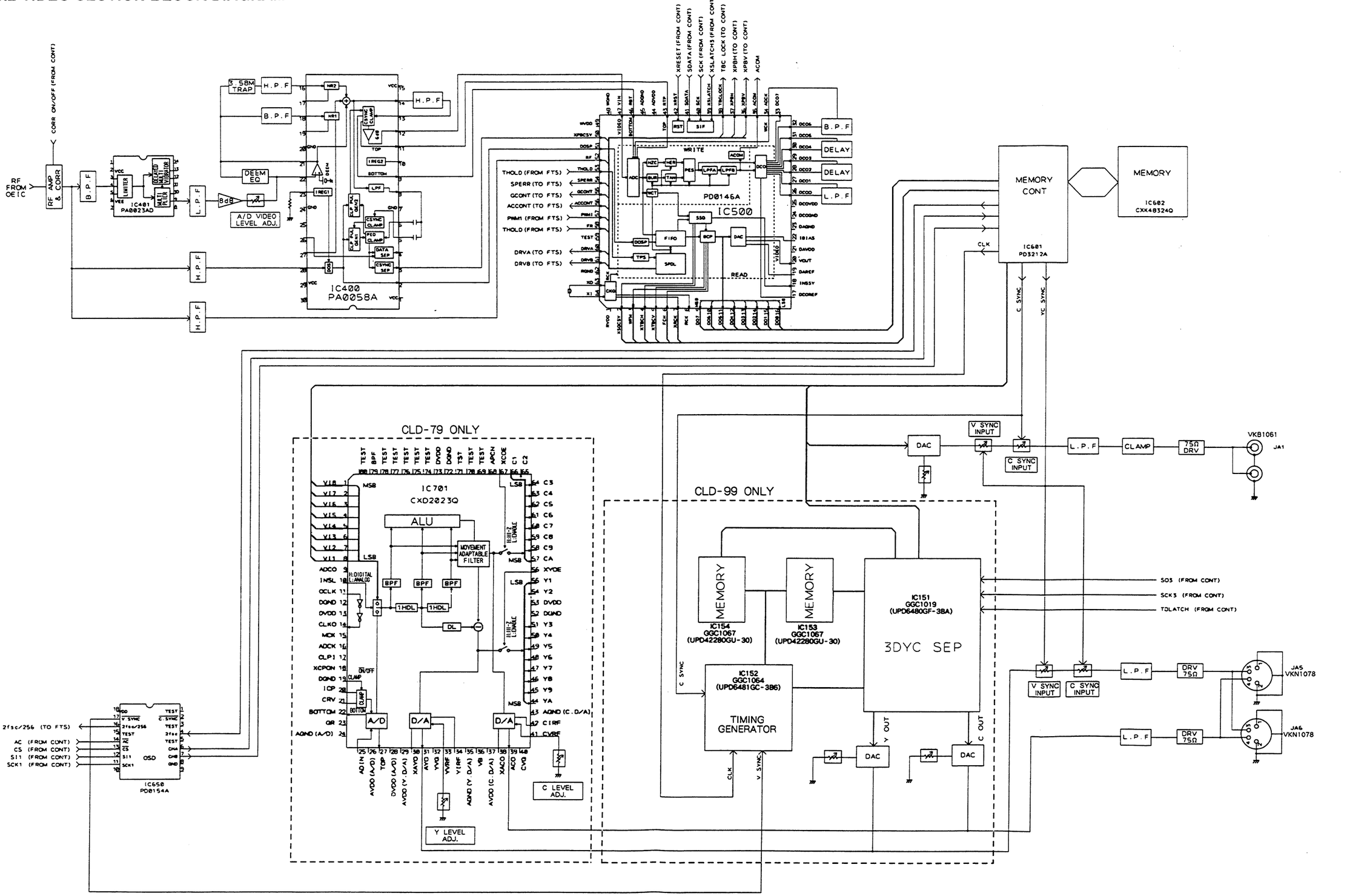
Fig. 7 C difference detection circuit

9. BLOCK DIAGRAMS

9.1 OVERALL BLOCK DIAGRAM

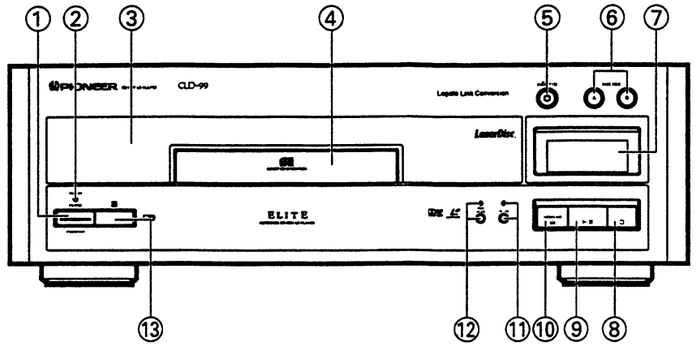


9.2 VIDEO SECTION BLOCK DIAGRAM



10. PANEL FACILITIES

FRONT PANEL



① POWER STANDBY/ON switch
Press to switch power ON/OFF (STANDBY).

② STANDBY indicator
This lights to indicate power standby.
When power is switched ON, it goes out.

③ Disc table

④ CD disc table

⑤ DIRECT CD button/indicator

⑥ DISC SIDE A/B button

⑦ Display window

⑧ Stop button (■)

⑨ Play/Pause button (►/II)
Press when power is OFF, and if there is a disc in the table, power is switched on and play starts.

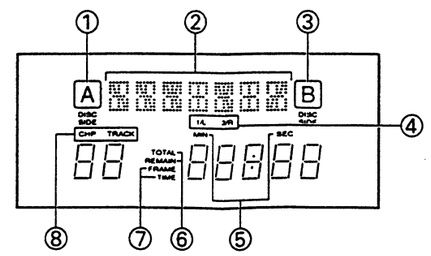
⑩ OPEN/CLOSE button (⏏)
Press when power is OFF, and power is switched ON and the disc table opens.

⑪ FL OFF display button/indicator
When you press the button, the indicator on top of the button lights and the display window switches OFF. Switching off the display prevents low level noise from adversely affecting sound quality. Press again to switch the display ON.

⑫ FILM MODE button/indicator
Switch ON if desired when watching a movie disc.
When you switch it ON:
- The display window turns OFF. You can switch it ON/OFF with the FL OFF display button ⑪.
- Screen display switches OFF.
- When changing disc sides, the picture is usually the memorized picture, but when using the Film mode, the screen is black.

⑬ Remote control sensor

DISPLAY



① Side A indicator

② Function operation indicator
Indicates functions and operations. Refer to function explanations for details concerning indications.

③ Side B indicator

④ 1/L channel, 2/R channel indicator
Indicates audio output channel.

⑤ MIN/SEC indicator
Indicates play time in minutes and seconds.

⑥ TOTAL/REMAIN indicator
Indicates remaining play time (REMAIN) and the total play time of the side (TOTAL).

⑦ FRAME/TIME indicator
Indicates frame number and elapsed play time.

⑧ Chapter/Track indicator
Indicates chapter number and track number.

11. SPECIFICATIONS

11.1 CLD-99

1. General

System ..... LaserVision Disc system and Compact Disc digital audio system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements ..... AC 120V, 60 Hz
Power consumption ..... 48 W
Weight 10.6kg (23lb 6oz)
Dimensions ..... 459 (W) x 432 (D) x 145 (H) mm
17-5/16 (W) x 17 (D) x 15-11/16 (H) in.
Operating temperature ..... +5° C ~ +35° C (41°F~95°F)
Operating humidity ..... 5 % ~ 85 %
(There should be no condensation of moisture.)

2. Disc

LaserVision Discs

*Maximum playing times
30 cm standard play disc ..... 1 hour/both sides
30 cm extended play disc ..... 2 hours/both sides
20 cm standard play disc ..... 28 min/both sides
14 min/one side
20 cm extended play disc ..... 40 min/both sides
20 min/one side

Spindle motor speed
Standard play disc ..... 1,800 rpm
Extended play disc ..... 1,800 rpm (inner circumference) to 600 rpm (outer circumference)
(For a 30 cm disc)

Compact Discs

DISC ..... Diameter: 5-inch, 3-inch, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Linear speed ..... 1.2 ~ 1.4 m/sec
*Maximum playing time ..... 74 min. 12 cm discs
20 min. 8 cm discs
(For stereo playback)

Compact Discs with Video

DISC ..... Diameter: 12 cm, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Linear speed ..... Audio portion : 1.2 ~ 1.4 m/sec
Video portion : 11 ~ 12 m/sec
*Maximum playing time ..... Video portion : 5 min. (CLV)
Audio portion : 20 min. (Digital)

*Actual playback time differs for each disc.

3. Video characteristics (two pairs)

Format ..... NTSC specifications
Video output
Level ..... 1 Vp-p nominal, sync. negative, terminated
Impedance ..... 75 Ω unbalanced
Jacks ..... Both RCA jacks

4. S-Video output (two pairs)

Y (luminance) - Output level ..... 1 Vp-p (75 Ω)
C (color) - Output level ..... 286 mVp-p (75 Ω)
Jack ..... S-VIDEO jack
Number of channels 2

5. Audio characteristics (two pairs)

Output level
During analog audio output ..... 200 mVrms (1 kHz, 40 %)
During digital audio output ..... 200 mVrms (1 kHz, -20 dB)
Jacks ..... Both RCA jacks
Number of channels 2

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	117 dB (EIAJ)
Dynamic range	99 dB (EIAJ)
Total harmonic distortion	0.0017 %
Wow and flutter	Limit of measurement (EIAJ)

6. Other Terminals

Control input/output ..... Both miniature jacks
Optical digital output ..... Optical digital jack
Coaxial digital output ..... RCA jack
AC-3 • RF output ..... RCA jack

7. Accessories

Remote control unit 1
Size "AAA" (IEC R03) dry cell batteries 2
Video cord 1
S-VIDEO cable 1
Audio cord 1
Operating instructions 1
Warranty card 1

11.2 CLD-79

1. General

System ..... LaserVision Disc system and Compact Disc digital audio system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements ..... AC 120 V, 60Hz
Power consumption ..... 46 W
Weight ..... 8.7 kg (19lb 3oz)
Dimensions ..... 420 (W) x 432 (D) x 140 (H) mm
16-9/16 (W) x 17 (D) x 5-8/16 (H) in.
Operating temperature ..... +5° C ~ +35° C
(41°F ~ 95°F)
Operating humidity ..... 5 % ~ 85 %
(There should be no condensation of moisture.)

2. Disc

LaserVision Discs

*Maximum playing times
30 cm standard play disc ..... 1 hour/both sides
30 cm extended play disc ..... 2 hours/both sides
20 cm standard play disc ..... 28 min/both sides
14 min/one side
20 cm extended play disc ..... 40 min/both sides
20 min/one side

Spindle motor speed
Standard play disc ..... 1,800 rpm
Extended play disc ..... 1,800 rpm (inner circumference) to 600 rpm (outer circumference)
(For a 30 cm disc)

Compact Discs

DISC ..... Diameter: 5-inch, 3-inch, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Linear speed ..... 1.2 ~ 1.4 m/sec
*Maximum playing time ..... 74 min. 12 cm discs
20 min. 8 cm discs
(For stereo playback)

Compact Discs with Video

DISC ..... Diameter: 12 cm, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Linear speed ..... Audio portion : 1.2 ~ 1.4 m/sec
Video portion : 11 ~ 12 m/sec
*Maximum playing time ..... Video portion : 5 min. (CLV)
Audio portion : 20 min. (Digital)

*Actual playback time differs for each disc.

3. Video characteristics (two pairs)

Format ..... NTSC specifications
Video output
Level ..... 1 Vp-p nominal, sync. negative, terminated
Impedance ..... 75 W unbalanced
Jacks ..... Both RCA jacks

4. S-Video output (two pairs)

Y (luminance) - Output level ..... 1 Vp-p (75 Ω)
C (color) - Output level ..... 286 mVp-p (75 Ω)
Jack ..... S-VIDEO jack
Number of channels 2

5. Audio characteristics (two pairs)

Output level
During analog audio output ..... 200 mVrms (1 kHz, 40 %)
During digital audio output ..... 200 mVrms (1 kHz, -20 dB)
Jacks ..... Both RCA jacks
Number of channels 2

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	115 dB (EIAJ)
Dynamic range	98 dB (EIAJ)
Total harmonic distortion	0.0025 %
Wow and flutter	Limit of measurement (EIAJ)

6. Other Terminals

Control input/output ..... Both miniature jacks
Optical digital output ..... Optical digital jack
Coaxial digital output ..... RCA jack
AC-3 · RF output ..... RCA jack

7. Accessories

Remote control unit 1
Size "AAA" (IEC R03) dry cell batteries 2
Video cord 1
S-VIDEO cable 1
Audio cord 1
Operating instructions 1
Warranty card 1